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ADDRESS.

PRESIDENTIAL ADDRESS.

Address delivered before the Middle Tennessee Medical Society at Murfreesboro, Tenn., Nov. 18, 1897.

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The mission of the doctor of medicine should not be merely to relieve the physical ills of humanity. His association with the inner side of human life is the closest, his knowledge of human nature and the human mind is the most exact, therefore his ideas of their needs should be the most reliable.

These facts being true he should open his eyes to many questions that concern the moral health of humanity and its offspring.

He should study the cause and effect of moral disease, he should endeavor to become so expert as to be enabled to recognize the prodromus of vice, and above all he should seek earnestly and diligently for remedies, both preventive and curative, for moral perversion and disease.

The subject of my address is not, strictly speaking, a scientific question, yet it is so pre-eminently a question whose ultimate solution can be found only through us as physical and moral educators of the people, and through the people of the law-makers of our commonwealth, a question fraught with such grave import now, and one promising infinitely graver importance a few generations in the future that I deem no apology necessary for its presentation to you.

Dr. Holmes said, "the time to begin the training of a child is one hundred years before its birth." I say the time to begin moral character building, physical development and the teaching of obedience to natural and civil law is many generations before the birth of the child.

After God had created the world, the heavens with an effulgent sun, pale beautiful moon and myriads of bright twinkling stars, and the earth and sea with their countless forms of animate life and inanimate matter, He reached the climax of His creative power and made in His own image the being called man. He endowed him with physical strength and beauty and mental power. He made him a perfect creature, limiting the likeness to Himself only in so far as He withheld His own attribute of divinity. By reason of this limitation man was prone to human thought, emotion, impulse and desire; hence God in His omniscience foreseeing the loneliness and uselessness of his future, in a very ecstasy of creative desire conceived fair, beautiful woman. This peerless creature pleased the man, she realized to him his ideal of a companion and helpmeet, he loved her and wooed her, and so for the first time in history of the universe was a wedding celebrated.

With these two beings God's creative office ceased; the necessity for further creative acts was ended, for the world was replete with animal life, and all His creatures were given the power to reproduce their kind; a power little less wonderful when viewed from a physiologic standpoint than the divine creation itself; a power of heredity capable of marring the earth with crime and sin, or blessing it with peace and love.

God, judging from the beautiful richness, the chaste beauty and the peaceful congruity of Eden, intended His creatures to be forever happy and innocent. To this end He formulated an incomparable code of natural laws to govern them. He bestowed upon all creatures other than man a brain faculty called instinct that enables them to live in obedience to these laws; this they do with resultant health and contentment. Man, the highest form of animate nature, He endowed with faculties of intellection and judgment to enable him to differentiate between right and wrong, to enable him to make his gross and sensual self subservient to the spiritual and moral, but at the same time with volition to choose between them.

We, as physicians, know these natural or physiologic laws; we know that their observance will insure health and happiness to mankind and to his offspring, and that disobedience will destroy the peace and purity of his conscience, will pervert the strong qualities of his mind, will corrupt his body and will entail a heritage of mental depravity, physical imperfection and predisposition to crime upon unborn generations. Shall we then view with sightless eyes and hear with deaf ears the manifold depravities of the people who support us, and their grave errors of training to children perhaps already vitiated with an unhealthy heredity?

The first man and woman must have been ideal creatures. It requires small effort of imagination to picture the elegant contour of the man's form, the brawn of his muscles, the grace of his actions and the perfect poise of his mind, because we are told he was created in the image of his creator.

Even less effort is needed to picture the first woman. Her form must have been the perfection of symmetry and grace, and her face must have looked the sunshine of beauty and intelligence. Clothed in raiment of chastity, no wonder she became the mother and type of creatures whom men will love forever.

These two creatures, perfect at their creation, embodying the heighth and breadth of physical, moral and mental development, full grown, well-rounded manhood and womanhood with the first breath were intended to reproduce men and women equally as perfect. And but for transgressions of natures law from the beginning of time men and women would be today without flaw or blemish.

Flaws and blemishes of physical organism, mental faculties and moral character are transmissible by heredity just as are form and feature. Our progenitors, by reason of their transgressions of physiologic

laws and error of development, the result of their forefathers' sins, have given to us as a heritage many mental, moral and physical defects coupled with manifold good qualities of character and conscience. What we are at birth and during childhood we are not responsible for, but we are responsible for what we become after judgment and discretion have developed, unless perchance our environments were previously so depraved as to perpetually deform our moral natures, and the atmosphere of vice so dense as to forever exclude the sunshine of virtue.

Parents are responsible for those perversions that find root and flourish in and control the natures of their children before the development of discretionary power.

We as physicians are responsible for our failure to do missionary work of reform and education among the ignorant and indifferent on this subject; and our fair State is disgraced beyond power of expression by her manufacture of confirmed criminals out of children before and at the threshhold of maturity through her infamous practice of imprisoning them into the company and tutorship of criminals, who long since ceased to sigh for their lost purity and are dead to reformation.

A vitiated heredity is beyond doubt responsible for an impulse in childhood to commit crime that is well nigh resistless, possibly wholly so, if there have been no counteracting influences at work in the life of the little criminal. Because this is a fact, should in cases of legal trial of the youthful call for the most intelligent jury of investigation, whereas, probably in most cases densest ignorance sits in judgment. It should provoke the most painstaking inquiry into heredity and environment in courts of law, whereas legal inquiry into this question is comparatively unknown. If found to exist it should call forth acquittal so far as imprisonment with hardened criminals is concerned and provoke the consideration of reformatory action, whereas under present conditions, knowledge of tainted heredity and vicious training creates in the minds of judge, jury and populace, prejudice that is the initial step to conviction.

Many boys have been sentenced to our State prison and confined with common criminals. Our governor has informed me that immediately upon the advent of one of these children there is a fierce fight among the men for his possession. The victor uses him for sexual gratification, thus transforming him into a sexual pervert, and in many instances a hopeless invalid. And yet our governor is criticised for the free exercise of his pardoning power.

The sexual perversions and criminal desires that will be surely and irremediably engrafted upon the tainted inheritance of these imprisoned children will forever preclude a normal, healthy sexual and moral post-prison life, so that whereas confinement in a suitable reformatory institution, under wise, capable and Christian supervision might have so far overcome hereditary predisposition as to have at least made law-abiding citizens of them, they are now forever shut out of opportunities of useful citizenship. They perhaps become the heads of families of libertines and prostitutes, and worse, they become eager and indefatigable teachers of perversion and crime to the innocent.

Picture if you can the pitiable and hopeless condition of individuals born with an inheritance of moral depravity, they can not unaided shake off, forced by inheritance and environment to become criminals and reprobates, then show the pity, charity and compassion that are claimed as the bed-rocks of our profession by united and untiring efforts toward an ultimate and radical change in the management of our youthful criminals.

Mr. Dugdale, former member of the prison association of New York, has made an interesting study of this question and gives us the following information: "When visiting the various jails of the State he found in one six persons incarcerated for crimes, between all of whom there was a family relationship. On further inquiry he found that of the same family there were twenty-nine relatives in the vicinity, seventeen of whom were criminals. Still further inquiry developed the following facts: Within seventy-five years a family of 1,200 persons have sprung from five sisters, several of whom were illegitimate, and three of whom were known to be unchaste, and who married men whose father was an idle, shiftless hunter, a hard drinker and licentious. Of this family the history of 709 was traced. Here is what is claimed as a true summary of said history: Paupers, 280; years of pauperism, 798; criminals, 140; years of infamy, 750; thieves, 60; murderers, 7; prostitutes and adulteresses, 165; illegitimate children, 91; number of syphilitics, 480; cost to State in various ways, $1,308,000" (Kellogg). This is a statement of what could be discovered. A complete discovery of the history of the whole 1,200 would doubtless have revealed a more horrible showing. This is certainly a history of the grossest hereditary depravity, and proves the law of heredity in crime beyond denial. No doubt an extended study of the question would reveal an almost unlimited number of similar histories.

We hear almost daily histories of the most aggravated crimes committed by children of tender years, and are not shocked to the point of serious thought on the question of proper management of an army of children in our State, who are daily adding to inherited vice education of the most infamous character.

Gentlemen, allow me to put myself on record as saying, I believe the law of heredity is universal, and further, that in nearly all cases the degree of hereditary criminal vice is decided by the degree of maternal or paternal taint. To split the question finer, how many parents have transmitted an inheritance of absolute purity to their children? Where is the father who has not in his youth, even if outwardly pure, committed mental sins without number and nursed desires that set him aflame with ungratified lust? They are few. And I firmly believe that each uncommitted crime will give a man's delicate nervous system a shock whose influence will never be lost, will produce an impression on his moral nature, the effect of which will be transmitted to his offspring in the form of vicious predisposition differing in degree only from the most aggravated examples. If this be true the responsibility of all youthful criminals should ever be a matter of grave inquiry, and the medical profession would do an act of the most exalted humanity should it set in motion a wave of reformation that sooner or later would wash out the horrible blot on the pages of our criminal law.

Tennessee has institutions complete in all their details and appointments, that she holds open to unfortunate children deprived of certain senses, where, through wise teachers, natures' defects are supplied in especial education, and life made worth living to

them. For this she deserves the love of every patriotic man. How different with regard to little ones born blind to the beauties of a virtuous life, and deaf to the whisperings of conscience. In most of these cases early education and environment serves but to develop and intensify hereditary predisposition until crime as an inevitable sequence is irresistible. Is it now too late to take the back track in these little characters for the purpose of reformation? Are the possibilities of honest manhood and womanhood past beyond recall? I answer most emphatically, no! Even now in proper institutions under wise management, some at least of these characters could be reclaimed and trained into useful citizenship. But so long as our State prison opens her doors to children and youths who are only more or less responsible for their crimes, just so long will she close the door of honest living on them, and just so long will theft, prostitution and murder increase in the land.

There is not a remedy in our materia medica that will cure every case of any disease, no matter how potent it may be for good in the especial disease. Heredity, idiosyncrasy and environment will ever preclude the discovery of an infallible specific. Yet, notwithstanding this fact, men of science will forever study and work toward this end. So it is in moral disease. Legal statutes, reformatory measures, nor the teachings of priests, scientists and laymen will or can wholly cure moral sin. It was put into the hearts of men to stay, and the millennium will witness its extinction. Still, every man of virtuous desire and human compassion should strive to make his fellowman better.

I believe this truth applies especially to physicians, because they know, or ought to know, the three natures of man, the mental, moral and physical, more perfectly than men in any other calling, and because they are brought in such close touch with all classes, that opportunity for salutary teaching is unlimited. I venture the assertion that if every physician in Tennessee would bend his efforts in this direction for ten years, the State prison would close its doors on child criminals. Adequate reformatory schools would spring into existence, the moral tone of the people would be infinitely improved and the number of criminals of all classes would be even in that short time noticeably reduced.

We have city, county and State boards of health that are yearly becoming more painstaking in their supervision of individual and public health. We have commodious institutions in each division of the State where those bereft of reason are nursed and cared for. We have large schools where the deaf and dumb and blind are taught and supported, but if I am correctly informed we have no adequate organized State boards for the prevention of crime, nor adequate institutions for the care and reformation of child criminals. Is this safe? Is it just? Can we as guardians of the public health shut our eyes on the fact that neglect of the adequate handling of the child-criminal question actually creates a greater necessity for the institutions above named? We know that drunkenness, prostitution, etc., predispose not only the individual but also his offspring, to the development of some of the diseases at least for the treatment of which these institutions were built. Reform the children instead of condemning them to prison cells or allowing them to drift deep into the slums of vice, and you will start an upward development toward mental, moral and physical perfection that may some day obviate the necessity for such commodious institutions, or if such good result as this is never realized perhaps we may remain in as good condition as now, a no mean result.

The *Quarterly Journal of Inebriety* states, "The fact is startling that insanity has increased in proportion to the population over 100 per cent. from 1870 to 1890. Inebriety as a disease has come into more prominence during the last quarter of a century. It is certain that many cases of inebriety become insane, and an equal number are classed with the insane in statistics. The intimacy of these two so-called diseases suggests that the increase of insanity is due largely to inebriety, the latter being unrecognized as a distinct disease. Heredity is not recognized, and the evils of both insanity and inebriety are permitted to go on unrestrained to succeeding generations."

This is appalling. At this ratio, picture, if you can, the horrible figures a few decades in the future will produce. I quote the above facts not through a desire to discuss these diseases, but simply to bring before your minds some idea of the irresponsibility being daily transmitted to innocent babes by a vast army of mentally tainted men and women. This vast army is being daily recruited, and no efforts commensurate with its rapid growth are being made to counteract the fearful results. On the contrary, the same law that fills our jails and asylums with inebriate criminals and lunatics is favoring, yea, inviting a more rapid growth of inebriety and lunacy by licensing the manufacture and sale of alcoholic beverages. Our government is daily sowing the seed of hereditary crime that will surely bear the fruit of individual damnation and civil anarchy. A vast number of innocent babes by reason of inheritance and education will grow to childhood and youth with the stigmata of mental taint and moral infamy they sought not. They will stand before the bar of so-called justice for crimes for which they are not responsible. They will be condemned to prison cells that should never know their presence. Yea, at this same bar they will receive their doom for time and eternity.

This question is not now pressing itself upon you, but the day will come when it will force itself upon you in all its enormity, and demand a solution in the interest of social, civil and national welfare.

The day is coming when the medical profession will gladly and eagerly join hands with the State and populace in efforts of reformation of the tainted children of our commonwealth, and of the criminal laws that are not just.

Would that we were not content to calmly await the advent of this day. Would that each member of our noble profession might feel it a duty he could not shirk to at least drop wholesome truths of correct living and correct training into the minds of his patrons.

Would that my profession might begin some concerted and importunate action in its official bodies looking away out to ultimate revision of our criminal laws and the reclamation as far as possible of children morally tainted by heredity and education.

Extirpation of the Thymus Gland.—Carbone has been studying the effect of the extirpation of the thymus gland, and recently announced at a meeting of the Academy of Medicine at Turin, that he finds that the thymus is not an organ indispensable to the organism; its extirpation does not affect the growth of the animal. It probably has no hematopoietic function, and the slight azoturia that follows ablation is possibly to be attributed to irritation of the vagus.—*Gaz. d. Osp. e d. Clin.*, Aug. 15.

ORIGINAL ARTICLES.

LUMBAR NEPHROPEXY WITHOUT SUTURING.

BY N. SENN, M.D., PH.D., LL.D.

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CHICAGO.

Nephrorrhaphy for the fixation of movable kidney has had an extensive trial at the hands of the surgical profession ever since the operation was suggested and first practiced by E. Hahn of Berlin. There can be but little doubt that the operation has been performed many times unnecessarily in cases in which the symptoms were not produced by the displaced organ, and consequently failed to procure the expected relief. Nephropexy is a legitimate and established surgical procedure in all cases in which it can be established that the kidney is not only displaced, but is at the same time the direct cause of the manifold symptoms which such a condition may and often will produce. The many modifications which the operation has undergone is perhaps the best proof that the results heretofore obtained by the different methods devised have not proved satisfactory. In nearly all of the operations the kidney is sutured to the muscular structures of the lumbar incision and the lower border of the last rib, the sutures, usually four in number, including the capsule of the kidney and more or less of the parenchyma of the organ. All operators expose the posterior surface of the kidney by incising the adipose capsule and by displacing or excising a portion of this structure. It has been claimed that the fibrous structure of the kidney is incapable of producing new tissue, out of which adhesions are formed to anchor the organ permanently in its new location, which induced Tuffier to advise that the capsule should be freely incised and extensively stripped from the underlying parenchyma before suturing the organ in place. This practice, which fortunately was never extensively adopted, has undoubtedly resulted in serious and permanent damage to the organ operated upon. Experiments on the lower animals, as well as inspection of the capsule of the kidney operated upon at different intervals after the operation on the human subject, have demonstrated the fact that the capsule of the kidney, like fibrous tissue in any other part of the body, possesses a maximum intrinsic power of tissue proliferation when subjected to mechanical irritation under aseptic conditions. No modern surgeon would entertain for a moment the propriety of depriving the kidney of its normal fibrous investment as a preliminary step in performing nephrorrhaphy.

Nicoladoni has recently modified Tuffier's procedure by incising the fibrous capsule only to the extent to enable him to suture the kidney without including in the sutures any of the parenchyma. He makes an

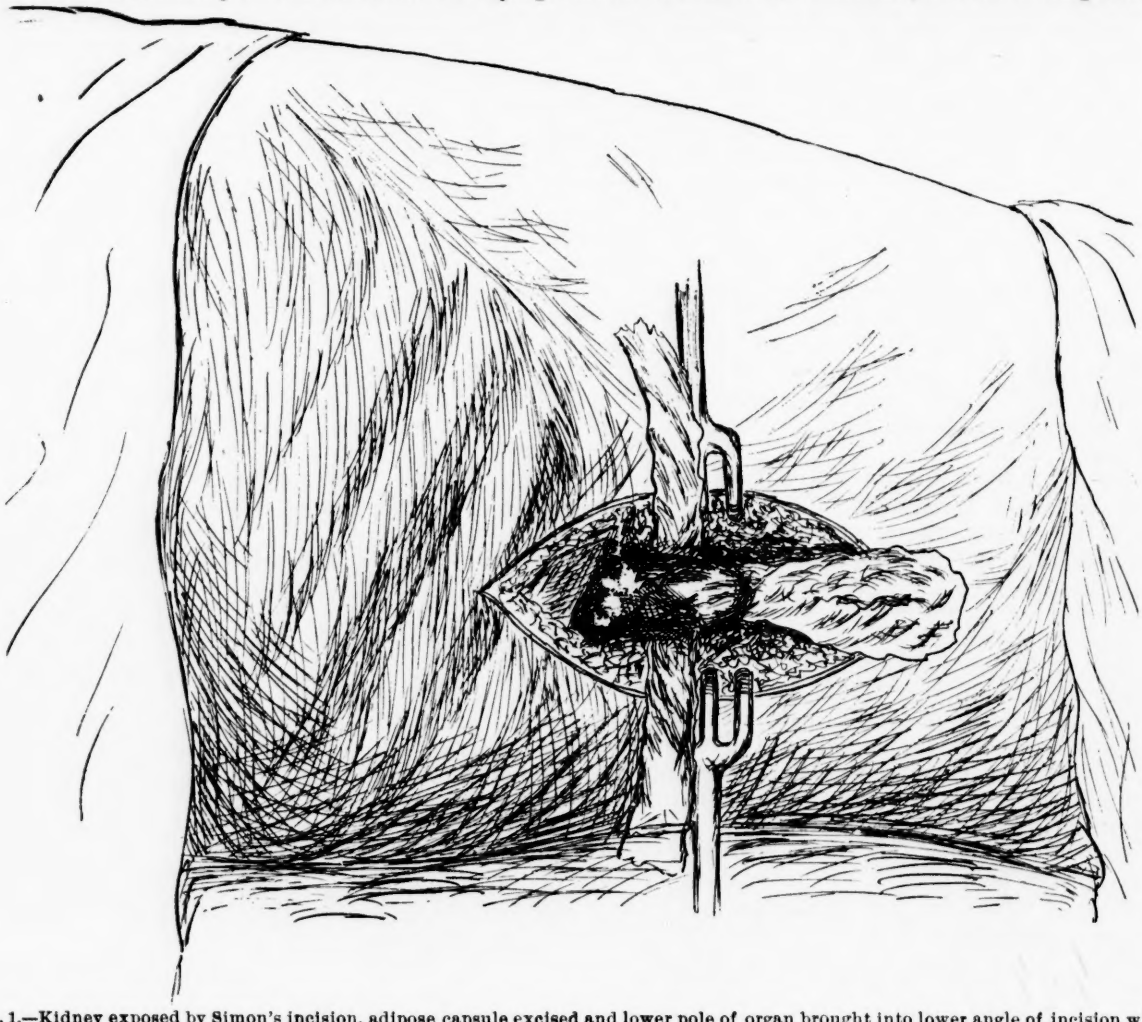

FIG. 1.—Kidney exposed by Simon's incision, adipose capsule excised and lower pole of organ brought into lower angle of incision with strip of gauze underneath it. Lower angle of wound packed with gauze.

incision through the capsule along the outer border of the kidney, detaches the capsule sufficiently on side and sutures the detached portions to the margins of the muscular part of the vertical lumbar incision. In some cases he joins the vertical incision at each end with a short transverse cut to facilitate the separation of the capsule to the requisite extent. Nicoladoni devised this operation and Rutkowski was the first one to apply it in practice, and the result is said to have been a most excellent one. The many failures which have followed suturing of the kidney in the lumbar region with limited exposure of its fibrous capsule is a strong argument against this method of performing nephrorrhaphy. The kidney substance is extremely friable and even if the sutures include a quarter of an inch of the cortex of the organ they are liable to cut their way through the tissues long before the kidney has become fixed in its new location by firm adhesions. All sutures, regardless of size and material they are composed of, fail to maintain the kidney in the desired location a sufficient length of time for the para-renal adhesions to become sufficiently firm to effect permanent fixation. Serious objections have recently been made and for good reasons against sutures which are made to include, as is usually done, a considerable portion of the kidney substance. Delagénière, Zatti and Albarran have shown that in the vicinity of the sutures sclerotic connective tissue forms with corresponding destruction of the parenchma condition which can not fail in bringing about serious functional impairment of the organ.

Jonnesco aims to obviate this source of danger by employing silver wire sutures, which he removes at the expiration of ten days. I have no doubt that the silver wire sutures cut their way through the soft kidney substance long before their removal even at this early period, and that the same amount of damage results from their use as from silk or catgut sutures which are allowed to remain. For years I have relied more on the extensive excision of the adipose capsule of the kidney than the use of sutures in the fixation of movable kidney. The permanency of the result depends largely on the extent of the excision of the adipose capsule. In the last four cases I have dispensed altogether with the use of sutures and have relied exclusively on the extensive excision of the pararenal fat, scarification of the fibrous capsule, direct temporary support of the kidney with a strip of iodoform gauze, iodoform gauze tamponade, prolonged dorsal recumbent position and localized compression of the abdomen over the kidney. Every surgeon knows that a movable kidney, unless fixed by adhesions in its abnormal location, will return to its normal position as soon as the patient lies flat upon the back and that it is not easy to bring it within reach unless the patient resumes the sitting or standing posture. If the adipose capsule is excised over the entire posterior surface of the kidney a gutter is created in which the kidney is safely lodged and from which it is difficult to dislodge it as long as the patient remains in the dorsal recumbent position. Brian and Jabouly rely largely on the iodoform gauze tampon brought in direct contact with the fibrous

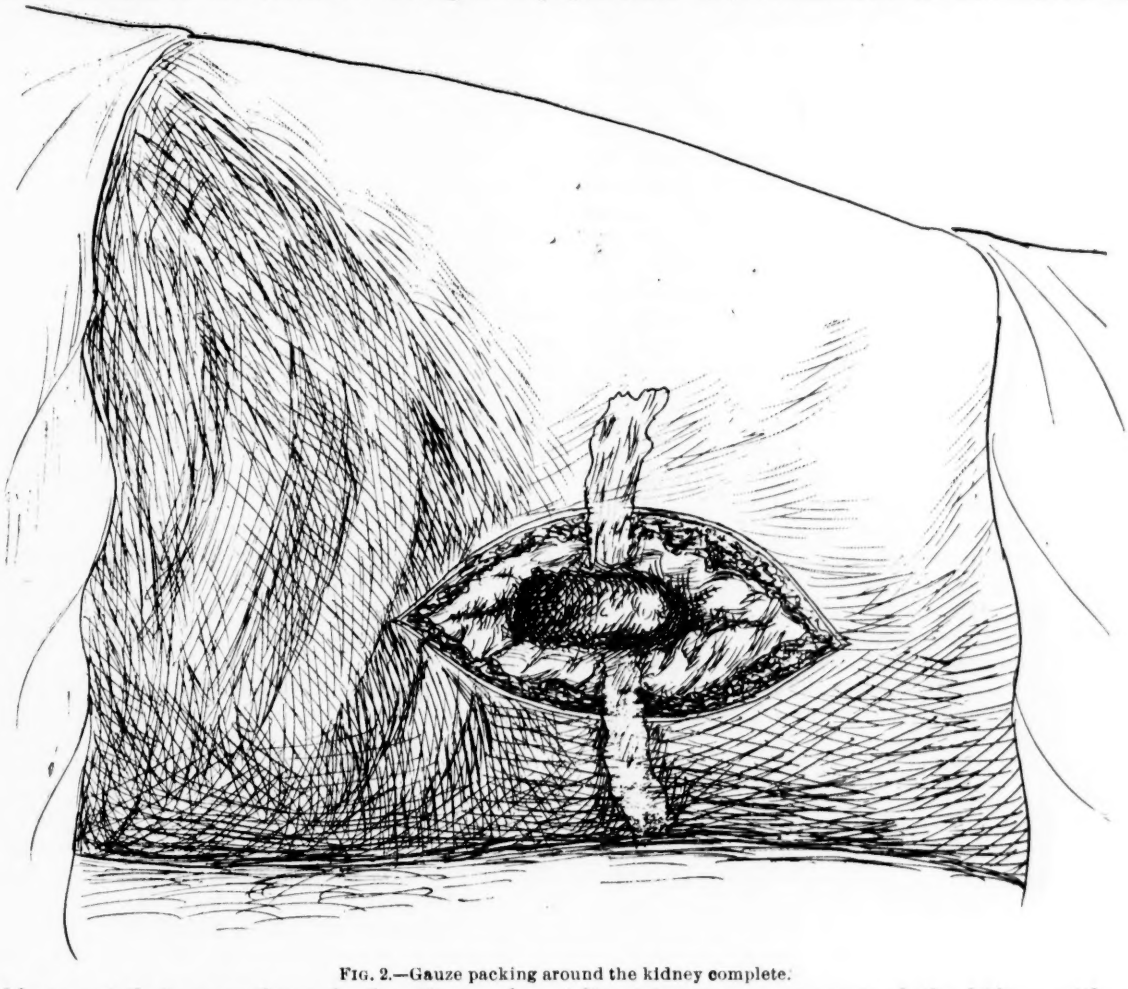

FIG. 2.—Gauze packing around the kidney complete.

capsule of the kidney in forming permanent anchorage by pararenal adhesions. For years I have placed more reliance on the tampon than sutures in the fixation of a movable kidney. My present method of nephropexy consists in exposing the kidney by Simon's vertical lumbar incision. As soon as the adipose capsule is reached the kidney is placed in proper position and is pushed forward into the wound by an assistant. About half of the kidney should project below the lower margin of the last rib. With dissecting forceps and curved scissors the adipose capsule is excised over the whole posterior surface of the kidney. The kidney is now brought well forward into the wound, the cut margins of the adipose capsule are pushed away from the kidney until the borders are freely exposed, when the fibrous capsule is thoroughly scarified with a long needle.

At this stage of the operation the lower pole of the kidney is grasped by its capsule with a French vulsellum forceps and brought well forward into the wound. With dissecting forceps, finger and blunt dissector the lower third of the kidney is laid bare and a strip of iodoform gauze about an inch in width and composed of four layers of gauze, is placed underneath the lower end of the kidney and each end brought out over the respective wound margin. By making traction on the forceps and gauze strip the lower end of the kidney is brought sufficiently forward to rest in the lower angle of the external incision. During the operation the margins of the external incision must be well retracted. With a long strip of iodoform gauze the floor of the wound is then carefully packed in such a way as to force the pararenal fat away from the borders of the kidney, leaving the posterior scarified surface of the kidney well exposed, when, with the same strip of gauze, this is covered and the whole wound well tamponed with another piece of gauze. The strip of gauze holding the kidney is then tied over the iodoform gauze tampon, which forms a wedge, and will effectually prevent displacement of the organ until firm adhesion has rendered any direct mechanical support superfluous. The two pieces of gauze are tied together and the wound dressed in the usual manner. No part of the lumbar incision is sutured. The patient is then placed upon the back and a firm compress the size of an adult's fist is placed over the kidney below the costal arch and held in place by a wide strip of adhesive plaster encircling the entire body. The patient is placed in bed with the pelvis slightly elevated, and is directed to remain in the dorsal recumbent position or side operated upon for at least four weeks, the time required for the formation of pararenal adhesions sufficiently firm to hold the organ permanently and securely in its new location. At the end of five or six days the tampon is removed. At this time the whole wound, including the capsule of the kidney will be found paved with vigorous granulations. The granulating surfaces are now brought together and held in contact with strips of adhesive plaster over a small absorbent aseptic dressing. Over this an additional dressing is applied, which with the abdominal compress is held in place with an additional strip of adhesive plaster and gauze roller. At the end of three or four weeks the whole wound will be found healed by primary intention and the kidney firmly fixed in its new location. The retention of the kidney in its normal location by this method affords not only a firm support by permanently fixing the lower end in the lower angle of the external incision and by securing broad surface adhesions, but the oblique angle in which it is anchored adds another mechanical condition calculated to maintain the organ in position, while this position will also tend to correct flexion of the ureter if such exists at the time the operation is performed. The immediate and remote results obtained by this method of operating in the last four cases have proved so satisfactory that I am not disposed to return to suturing again and strongly recommend this method of performing nephropexy for further trial by the profession.

THE TECHNIQUE OF ABDOMINAL HYSTERECTOMY.

Presented to the Section on Obstetrics and Diseases of Women at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

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The abdomen is to be opened in the usual way and by as free an incision as necessary. Free the uterine mass from adhesions as thoroughly as possible, and draw it up into the incision; draw up the most accessible broad ligament and clamp it just outside of the ovary with a long clamp, the point of which is directed obliquely downward toward the cervix; with a short forceps grasp the upper border of the broad ligament near the uterus, so as to prevent recurrent hemorrhage through the ovarian artery; then sever the broad ligament with scissors, along the clamp first applied. The other broad ligament is then, if possible, to be treated in the same way. A peritoneal flap is now made in front, between the tips of the two clamps; this is best done with scissors; as this flap is dissected up, the bladder is carried with it and is thus separated from the uterus; a shorter peritoneal flap is then made on the posterior surface between the tips of the clamps.

Up to this point the uterus itself has not been interfered with, and the uterine arteries have not yet been reached. The layers of the broad ligament are now separated on each side, by the fingers, between the tip of the clamp on each side and the uterus, and the uterine arteries found and seized with forceps. With scissors curved on the flat (or, better still, with a Kelly's spud), the body of the uterus is next detached at or just below the level of the internal os, being so detached as to give an anterior and posterior flap of uterine tissue. In case there is any great difficulty in reaching the uterine artery before detaching the uterus itself, its seizure may be omitted until it spurts, as the uterus is being severed, when it is easily seized by an assistant. It is sometimes difficult, or even impossible, to secure both arteries before getting the tumor out of the way. In that case, I cut across from the side on which I have seized the artery and, after separating the mass, seize the base of the opposite broad ligament en masse below the point of separation, and then enucleate the tumor from below upward. This is the method recommended by Kelly, and one which, in suitable cases, possesses points of advantage.

The tumor has now been removed, the pelvis is empty, and hemorrhage has been entirely controlled, except perhaps a little oozing from the cervical flaps. If the patient has not already been placed in the

Trendelenburg position, this should now be done. The uterine arteries are next separated from any surrounding tissue and ligated as far back as possible, with fine silk, catgut or kangaroo tendon, and the projecting ends snipped off. The round ligament is then caught with forceps next to the long clamp, so as to enable it to be quickly found later on, and the clamp removed from the broad ligament. The ovarian artery is then easily found and drawn out from between the folds of the ligament, ligated and the projecting end cut off. The same is then done on the opposite side. Four ligatures have controlled all hemorrhage, though occasionally an aberrant branch will require ligation.

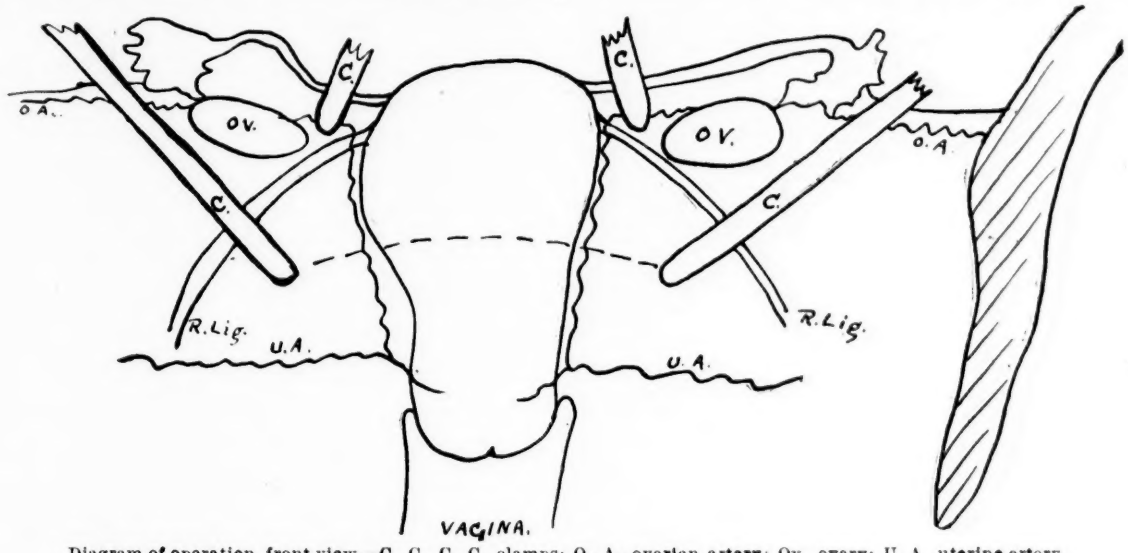


Diagram of operation, front view.—C., C., C., C., clamps; O., A., ovarian artery; Ov., ovary; U. A., uterine artery. Broken line represents peritoneal flap.

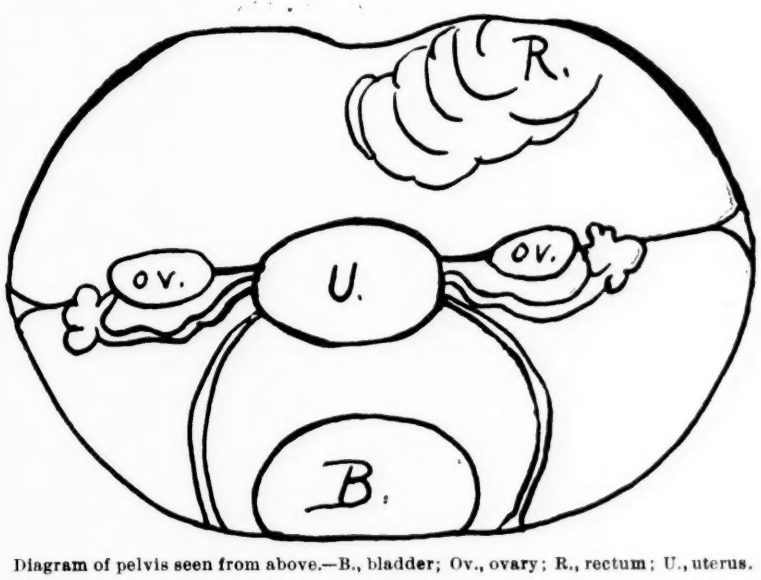


Diagram of pelvis seen from above.—B., bladder; Ov., ovary; R., rectum; U., uterus.

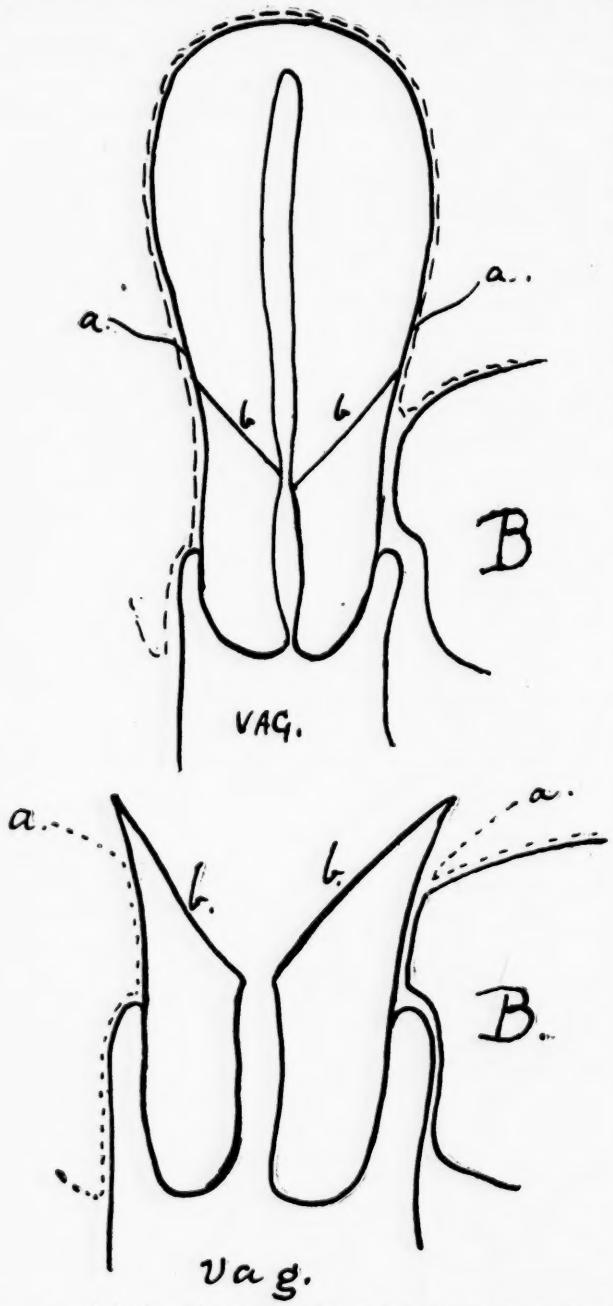
A long probe is now threaded with a strip of iodoform gauze, about one inch wide, passed through the cervical canal into the vagina, and seized by an assistant. The gauze is drawn through the cervix, except an inch or two which I hold in my fingers, and the probe detached as it appears at the vulva. The end of the gauze which projects above is now cut off just flush with the bottom of the wound. The passage of this gauze mechanically cleans the cervical canal, and also secures drainage in case of any oozing.

With kangaroo tendon the uterine flaps are now brought into apposition by a running suture. This suture is first inserted through the anterior cervical flap at one side, is then passed through the end of the round ligament of that side, and then through the posterior flap. As this suture is now made taut and tied, the round ligament becomes implanted between the flaps. By a similar maneuver the opposite round ligament, at the proper time, is implanted between the flaps upon that side. If the round ligaments are too long they can be shortened before being transfixed, so as to give the desired degree of support to the stump.

Commencing next at the upper edge of one broad ligament stump, the peritoneal layers are inverted and with kangaroo tendon, or catgut, are united by an "over-and-over" suture which runs down the broad ligament, then across over the cervical stump, turning in the peritoneal flaps as it proceeds, and up on the opposite side. This suture should be so inserted as to draw the tissues of the broad ligament snugly together. These being thus snugly apposed, unite so as to make excellent supports for the stump in addition to the round ligaments already attached. The operation when thus completed leaves a perfectly

smooth pelvic floor, with, at no point, the exposure of any raw surface for adhesions.

In case, for any reason, drainage of the pelvis is desired, this is accomplished by opening Douglas's *cul-de-sac* and introducing a strip of gauze into the vagina. The abdomen is then closed in the usual way. My own method is to unite the fascia, muscle and peritoneum with silver wire, the twisted ends being



a, a, points of making peritoneal flaps; b, b, lines of amputation of cervix. Dotted line represents peritoneum.

cut short and turned down. As it has been found that in about one case in twenty some of these wires become infected and give rise to sinuses which remain until the wires are removed, I have for several months used another method of closing the incision; silk-worm gut sutures are first introduced, these passing through the entire thickness and including plenty of fascia and muscle, but only a little of the skin and peritoneum. The fascia is then approximated by a continuous suture of silver wire, the ends of which emerge about an inch beyond the ends of the incision. Before tightening the wire, the silk-worm gut sutures are drawn up snugly and held by an assistant, but not tied; the wire is then seized at each end, drawn taut, and pulled back and forth until all bends are removed and it is practically straight; the ends are then fastened by perforated shot, several layers of iodoform gauze being interposed between the shot and the skin. The silk-worm gut sutures are then tied. The wire can be slipped out without any trouble at the end of ten days or two weeks. I am especially careful to get the fascia well into apposition. The skin is then closed with silkworm gut, or the subcuticular kangaroo tendon suture. If the abdominal walls have a thick layer of fat, this is held in apposition by two or three stay-sutures, as needed.

In case it is desirable to remove the entire uterus, the cervix instead of being cut across is enucleated in the usual way. It is sometimes better to remove the tumor first and then to enucleate the cervix. In such cases a pledget of gauze should be introduced into the vagina from above, so as to drain the point of separation of the cervix, but the peritoneum should be completely closed, as above described, including the bringing in of the round ligaments.

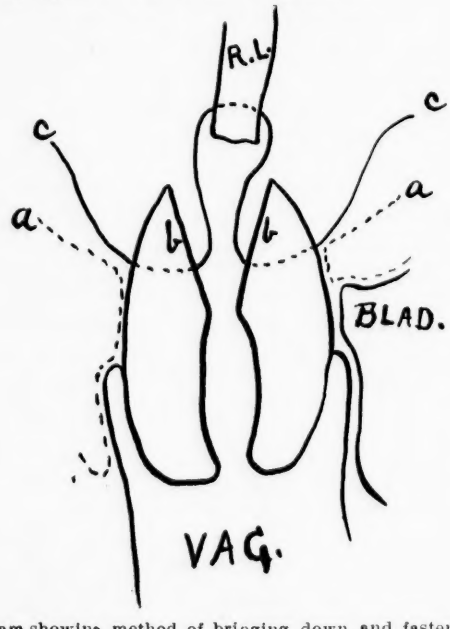


Diagram showing method of bringing down and fastening round ligaments in closing cervical flaps. a, a, peritoneal flaps; b, b, cervical flaps; c c, suture; R. L., round ligament.

During the last two and a half years in which I have been using this method, I have made ninety-five operations with five deaths, a mortality of 5.26 per cent. Three of these were in cases of cancer of the fundus with wide dissection and unfavorable conditions. In a recent paper by E. W. Cushing, M.D., of Boston, on the "Evolution of Abdominal Hysterectomy," he tabulates 1,670 operations from the reports of thirty-six of the leading operators of the United States. The average mortality of these operations was 13.8 per cent. During the last year I had the opportunity of watching abdominal hysterectomy as performed in many of the leading gynecologic clinics abroad. Almost without exception, I found their methods quite crude and unsystematic, while their mortality I found to vary from about 15 to 25 per cent.

In my own cases, in only one instance was death

due to post-operative infection. Post-operative morbidity has been almost *nil*. Very few patients have remained in the hospital over twenty-one days after the operation. One case was removed to her own home on the tenth day. No cases of ventral hernia or of vaginal prolapse have occurred. There is sometimes some complaint of pain, but this is usually much less than after the performance of vaginal hysterectomy. Indeed, convalescence is very similar to that in normal child-bed, and patients usually sit up on the fourteenth day. The operation is a short one, usually requiring about forty minutes for its completion, and there is practically almost no hemorrhage. These two statements explain the fact that there is usually almost no shock.

The advantages of this method of operating are:

1. Such a shutting off of the vagina as to reduce to a minimum any danger of infection from that source.

2. The ligature placed around the uterine artery is entirely outside of the uterine wound, and being of fine material and buried in the tissues is much less likely to give any trouble.

3. The snug closing of the cervical tissue prevents oozing.

4. The smooth peritoneum in the floor of the pelvis, having no projecting stumps or raw surfaces, reduces to an absolute minimum the danger of intestinal adhesions.

5. The implantation of the round ligaments and puckering in of the stumps of the broad ligaments prevents prolapse of cervical stump and vagina.

6. The use of the clamps on the broad ligaments obviates hemorrhage, leaves the parts in better shape for the subsequent steps of the operation, and saves considerable time.

HOW SHALL WE FEED THE BABY?

Presented to the Section on Diseases of Children, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, June 1-4, 1897.

BY A. C. COTTON, A.M., M.D.
CHICAGO.

If at the breast and doing well, leave it alone. If not doing well, let us ascertain the cause. Does it present evidences of innutrition, malnutrition, acute indigestion or chronic indigestion? Is there starvation from insufficient or improper food, or starvation from repletion? In some cases the fault is apparent at a glance; in many it is quite difficult to determine at first wherein the trouble lies. The apparent error as to time, frequency of feeding and quantity having been corrected, the physician may finally have to face this question, "can this mother's milk be made to fill all the requirements of this babe?" and the sooner we ascertain just what and how much this mother is secreting, the sooner we are on the way to a solution of this problem. We must examine the breast milk as to its total amount and as to the relative quantity and quality of its constituents. The old haphazard procedures must be relegated to the past; the time has come when the same exactitude is demanded in this as in other means of diagnosis. We must know *what* the babe is *getting* before we can intelligently consider any changes in food. Analysis, then, of the mother's milk must be the prime desideratum if we would give advice as to the feeding of babies.

There are a number of methods in vogue for determining, with greater or less accuracy, the relative proportion of some of the leading ingredients. For clinical purposes a determination of the total solids may be had from the known specific gravity, temperature and percentage of butter fat by means of Richmond's equation: $T = (G \div 4) + (6 \div 5)\ F + 0.14$, in which T = total solids, G = specific gravity (the last two figures), and F = fat. Care should be taken to correct specific gravity for temperature if the ordinary hydrometer adjusted at 60 degrees F. be employed. Holland subtracts one from the hydrometer reading for each ten degrees below 60 degrees F., and adds one to the reading for each ten degrees above 60 degrees F., proportionate fractions expressing variations of less than ten degrees.

For determining the percentage of fat we have employed Fesser's lactoscope, also the methods of Holt, Marchand, Leffmann and Beam, and Babcock, with preference for the last-named on account of its simplicity and accuracy. The first mentioned has the disadvantage of inaccuracy from the varying visual power of different observers, also from the fact that the opacity of milk is not due alone to the fat globules but also to the phosphate of calcium present. Holt's method, so easy of employment, requires time, twenty-four hours, and the ratio 5 to 3 does not always express the relation of cream to fat. Marchand's test has never given the results obtained by us from more accurate analysis.

The centrifugal machines adapted to the Babcock test bottles have heretofore been too clumsy, but recently the Chicago Dairy Supply Company, No. 5 West Washington Street, has brought out a small cheap machine. My attention has been called to a bottle manfactured by Wood & Comer, 130 Juvenal Street, Philadelphia, of shape and size to fit the ordinary office centrifuge and adapted by graduation to the Leffmann and Beam method. The capacity of this tube is certainly not more than 20 c.c., so that the quantity of milk required by the Leffmann and Beam test would not exceed 8 or 10 c.c., an item greatly in its favor. If experience proves the utility of this tube its advantages place it far in advance of any previous device for determining the fat in breast milk. The microscope is a necessary adjunct to the examination for the presence in the milk of blood, pus or colostrum corpuscles.

If the child's nutrition does not improve soon, I would remove it from the breast temporarily, keeping up lactation by pumping regularly and testing the milk meanwhile for the improvement sought. Not infrequently the child may be returned to the breast after an interval of from a few days to a few weeks. In my opinion there is no question as to the desirability of maternal nursing in preference to any method of artificial feeding. If, after all, the mother's milk can not be brought to suitable proportions for complete nutrition, or for any reason weaning is necessary, then substitute feeding must be adopted, and the choice of a substitute becomes at once a question of the highest importance. The multitude of infant foods and substitutes for mother's milk suggests the conclusion that none are completely successful, and the startling mortality statistics would be conclusive evidence did any doubt exist. So long as the medical profession relegates its thinking to commercial men, the market will continue to be flooded with "baby foods" and the figures of infant mortality repeat themselves with sickening regularity. What, then, of a substitute for mother's milk? We *have* no *substitute*, as the death rate shows, but we have well-

established principles of substitution, by the thoughtful application of which to the especial requirements of each individual case, we may claim to have made some headway in the management of disordered infant nutrition. In the selection of the food we must consider all the requirements of the infant at each stage of its development, and a few cardinal principles kept well in mind may serve as a foundation for specialization. Professor Cheadle, in his post-graduate course of lectures at St. Mary's Hospital, London, emphasizes six essential conditions to be observed in the diet of infants:

1. "The food must contain the different elements in the proportion which obtain in human milk," viz., according to Harrington: Proteid, 1 to 2 per cent.; fat, 3 to 4 per cent.; sugar, 6 to 7 per cent.; ash 1 to 2 per cent.; water, 87 to 88 per cent.; or, according to Luff, proteid, 2.35 per cent.; fat, 2.41 per cent.; carbohydrate, 6.39 per cent.; salts, .34 per cent.; water, 88.51 per cent.

2. "The total quantity in twenty-four hours must be such as to represent the nutritive value of from one to three pints of human milk, according to age," viz. proteids, 225 to 675 grains; fat, 231 to 693 grains; sugar, 613 to 1,839 grains.

3. "It must be in a form suited to the physiologic condition of the digestive function of the infant."

4. "It must not be purely vegetable, but must contain a large proportion of animal matter."

5. "It must possess the antiscorbutic element," raw.

6. "It must be fresh and free from all taint of decomposition."

These six statements as to essential conditions seem to be almost axiomatic and if faithfully observed will keep the practitioner quite close to the line of safety.

Since the sources from which the essential ingredients of infant food may be obtained are so numerous, and the facilities of different physicians so varied, it is not strange that a variety of methods of assembling the necessary constituents for a perfect substitute food should be advocated. Eminent observers and experimentors along this line have seemed to array themselves by their practices into three general classes, viz.:

1. Those, who by their use of cereals, treat the human infant as if belonging to the *herbivora*.

2. Those who would place him with the *carnivora* and find nothing to meet his physiologic requirements outside of milk, meat juice, animal extracts, etc.

3. Those who by a judicious selection of the essential elements of food from both animal and vegetable sources consider the babe *omnivorous*. Certainly, analogy, and I believe, also experience shows that the young infant finds its most assimilable and nutritious elements in *animal* foods, and no teacher of infant feeding has recently laid the world under greater tribute for his positive stand in this direction than Dr. Rotch, the father of the milk laboratory in this country. Believing that the babe should have exclusively animal diet, and that cow's milk contains all the essentials of mother's milk, but in different proportions, he founded the laboratory for the modification by separating cow's milk into its grosser constituents and reassembling them in exact and definite proportions to meet the requirements of the individual case. I have never heard it claimed that there was anything *new* in the modification of milk. In fact, many practitioners claim to have done this long before Rotch, and wonder why the process should be deemed worthy of a patent. The putting of the idea into practical form through the laboratory, securing uniformity of manipulation by trained experts, the supervision of the milk supply (perhaps the most important feature) and last but not least, the stimulation of keeping exact records, all mark the advent of the laboratory as the longest stride in the advancement of substitute feeding.

The province of the milk laboratory, however, is broader than many would at first suppose from its name. With all due respect to Dr. Rotch I should prefer to call it a "food laboratory," where prescriptions may be compounded to meet the requirements of prescribers who do not believe that all the ingrediients should be derived from cow's milk. Some infants can not digest cow's casein in any form, be the quantity reduced to the minimum limits of laboratory modification, or if only so small an amount can be endured as must of necessity appear in the cream, his nutrition will show faults from lack of proteids. In such cases many of our best men order raw meat juice.

The need of albuminoids when cow casein can not be tolerated (and this condition, I believe, is one of great frequency) must be met by substitution of some soluble, readily absorbed, concentrated albuminoid. No source of albumin in a condition to meet all the requirements of infant digestion, is, in my experience, to be compared with the hen's egg, the white. For many years I have employed it in suitable cases with the most satisfactory results. From the opening of the first laboratory in Chicago, October 1895, I have ordered egg albumin to maintain the necessary percentage of proteids in cases where cow casein was not tolerated. To illustrate by a prescription with ingredients proportioned as follow: Fat, 4.50 per cent.; sugar, 6.50 per cent.; proteids 2 per cent.; which not being well borne, the casein appearing in the stools as curds, is reduced in its percentage of proteids experimentally until the low figure of $\frac{1}{2}$ or $\frac{1}{4}$ of 1 per cent., represents the highest toleration of this constituent of milk.

Since complete nutrition can not long be maintained on such low proteids we must enrich our prescription with albuminoids from some source other than cow's milk. The egg albumin has proved very efficient in my hands for this purpose. To illustrate by prescription: Fat, 4.50 per cent.; milk sugar, 6.50 per cent.; proteids from milk, .50 per cent.; albumin, whites of two eggs; water, q.s. ad 100 per cent.; number of feedings, 6; amount of each feed, 6 oz.; alkalinity (lime water), 6 per cent. Pasteurization is not necessary if due care be exercised in the selection of the ingredients for this emulsion.

SOME PRACTICAL POINTS ON INFANT FEEDING AND INFANT FECES.

Presented to the Section on Diseases of Children, at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, Pa., June 1–4, 1897.

BY LOUIS FISCHER, M.D.

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NEW YORK, N. Y.

To properly determine the value of an infant's food

be it breast fed or hand fed, we must note the following factors:

1. Does the child appear satisfied and go to sleep after its feeding. 2. How are the stools? *a*, their color; *b*, frequency; *c*, consistency. 3. Is there any flatulence or colic? 4. Does the child increase in weight, to be determined by the scales once a week, and is the food properly assimilated?

A growing child needs far more food than its weight alone would indicate, for its income must exceed its expenditure so that it may grow. An infant for the first seven months or first one-half year of life should have nothing but milk. Up to this age vegetable food is unsuited to it; it is purely a carnivorous animal.

Human milk contains about 4 per cent. of proteids (casein), 2.6 per cent. fat, 4.3 per cent. carbohydrates (milk sugar). Of the solids, the proteids make up 36 per cent., the fats 24 per cent., and the carbohydrates 39 per cent.

In a typical adult diet, the proteids amount to 20 per cent. of the solids, fats 15 per cent., carbohydrates to more than 60 per cent. The diet of the infant is, therefore, nearly twice as rich in proteids, half as rich again in fats, and a little more than half as rich in carbohydrates as that of the adult. It is, therefore, in a physiologic sense a luxurious diet.

The strain of growth falls heavier upon the more precious proteids than upon the more cheap and common carbohydrates.[1]

Rotch, speaking of proteids (p. 174) says the proteids as a whole are a valuable source of information as to whether the milk is normal or abnormal. The following formulæ indicate the proper percentage required for hand-feeding at birth of the infant—and at several other periods thereafter with the same formulæ translated for home preparation, where the luxury of a laboratory can not be afforded. Proper sterilization of bottle-nipples and food is self-understood and it is not the purpose of this paper to elaborate on the same.

Child at birth. Formula 1.—New-born infant's food. Fat, 1.0; sugar, 5.0; proteids, 0.75; reaction alkaline. Ten feedings (30 c.c. each) heated thirty minutes to 167 F. The formula for home use is the following: Cream, 2 ounces; milk, 2 ounces; lime water, 1 ounce; water, 15 ounces; milk sugar, $6\frac{3}{4}$ drams; cream must contain at least 10 per cent. of fat.

Child one month. Formula 2.—Fat, 2.0; sugar, 5.0; proteids, 0.75; lime water, 5.0. Formula for home use: Cream, 4 ounces; milk, none; lime water, 1 ounce; water, 15 ounces; milk sugar, $6\frac{3}{4}$ ounces.

At four months. Formula 3.—Fat, 3.5; sugar, 6.5; proteids, 1.5; lime water, 5.0. Formula for home use: Cream, 7 ounces; milk, 1 ounce; lime water, 1 ounce; water, 11 ounces; milk sugar, $6\frac{1}{4}$ ounces.

From nine to twelve months. Formula 4.—Fat, 4.0; sugar, 7.0; proteids, 3.0; lime water, 5.0. Formula for home use: Cream, 8 ounces; milk, $7\frac{1}{2}$ ounces; lime water, 1 ounce; water, $3\frac{1}{2}$ ounces; milk sugar, $6\frac{3}{4}$ ounces.

Stool of a nursling.—The stool of a nursling or a baby on an exclusive milk diet should be yellowish in color, smeary or pasty-like in consistency and have an acid reaction. The smell should be faintly acid but not disagreeable. The color is due to bilirubin and the reaction depends on the presence of lactic acid, the source of which is the milk-sugar. The only gases present are H and CO_2. According to Escherich, H_2S and CH_4, to which the odor of adult stools is due, are not present. There are no peculiar albuminoids. Those existing in mother's milk seem to be entirely absorbed. Peptone exists in trifling amount. Sugar is not present. Pancreatic ferment is absent and sometimes traces of pepsin have been found. Mucus is always present in considerable quantity, also columnar intestinal epithelium.

In the stools of nurslings, large quantities of lactate of lime can be found, so also we frequently find oxalate of lime depending on the quantity of oxalate of lime ingested. Uffelmann has noted the presence of bilirubin crystals in the stools of nurslings, in perfectly healthy children.

Miller, who carefully studied the various microorganisms in the mouth, found that most of them could again be found in the intestinal canal. He further found that certain germs possessed diastatic properties and were capable of producing lactic acid fermentation. In the milk feces of nurslings Escherich found two germs, the one he called bacterium lactis aerogenes (or bacterium aceticum, Baginsky) and the other the bacterium coli commune. In the meconium he found proteus vulgaris, streptococcus coli gracilis and bacillus subtilis. The number of stools during the first two weeks is from three to six daily. After the first month the average is two stools daily; many infants have one, others three stools daily. This latter is due largely to the excessive quantities of water given to infants.

As soon as the exclusive milk diet is changed to the mixed diet we then loose the characteristic infantile stool and they resemble more those of an adult, though remaining softer and thinner throughout infancy. They become darker in color, assume the adult odor and have more varieties of bacteria than those previously mentioned as found in the stool of a milk diet.

Reaction of stools.—Reaction of stools in diarrheal disease and in health is chiefly acid or, next in frequency, neutral. Alkaline stools are rare. Green-grass stools, usually acid, are seen in the early stage of dyspeptic diarrhea, the color from a pale greenish yellow to grass-green, owing to improper food.

Wegscheider has shown that the green color is the result of preformed biliverdin. The condition in the intestine, upon which the transformation of bilirubin into biliverdin depends has been generally regarded as one of acid fermentation.

Experiments.—Pfeiffer's experiments ("Verdauung im Säuglings-alter bei Krankhaften Zuständen" Jahrbuch für Kinderheil., Bd. xxviii, p. 164) show this former opinion to be wrong. He found that none of the acids formed in such fermentation, lactic, acetic, butyric, propionic, etc., added to yellow stools outside the body, turned them green, but that they made them deeper yellow. But dilute alkaline solutions added to fresh yellow stools turned them green after an exposure of thirty to sixty minutes and strong solutions turned them, first brown, later, after exposure to air, intense green.

Typical green stools.—Typical green stools can be produced by giving an infant two or three grains of bicarbonate of soda. This I have tried dozens of times; the soda must be given for a few days. This explains Pfeiffer's alkaline theory. Typical green stools can also be produced by giving small or even large doses of calomel. If, after having given bicarbonate of soda and produced green stools, we give diluted hydrochloric acid in 5 to 10 drop doses, the yellow color will in a few days again reappear. This is also true in giving rhubarb.

Stools.— Stools which are pale yellow when discharged, and which afterward become green, are often

[1] "Stewart's Physiology," p. 412, 1897.

seen in disease. They may be themselves neutral or alkaline in reaction; this latter may however depend on the admixture of urine. An excess of bile may often cause very green stools.

Brown stools.—Brown stools may be due to changed biliary pigment and to drugs, *i.e.*, bismuth causes the well-known dark stool; so also tannic acid and all iron salts give the dark stool which varies from a deep brown to a black color.

Blood in stools.—Blood from the stomach or small intestine frequently gives the stool a black color resembling tar. Thus a practical point in Boas' "Diagnostik der Magen- und Darmkrankheiten" is, that the brighter the color of the blood the lower down near the rectum and anus must the pathologic lesion be looked for; the darker the blood the higher up must the cause be found, *e.g.*, the diseased conditions exist in the stomach, duodenum, jejunum, etc., if the stool contain black blood. If the corpuscular elements of the blood are wanting, then the presence of blood can only be positively diagnosticated by either a microchemic examination or by means of the spectroscope. The presence of red blood corpuscles must always be regarded as a pathologic factor.

Brown stools, muddy stools.—A brown stool in an infant is frequently caused by a diet of animal food or by a diet principally of broth. These stools have no distinct consistency nor reaction. In dyspeptic diarrhea or in some forms of enterocolitis we have very offensive stools and they resemble muddy water; with the latter there is considerable flatus during each movement.

White or light gray stools.—White or light gray stools usually are of a putty-like consistency, sometimes like dry balls on a diaper; sometimes they appear like ashes. Uusually they are very offensive, consisting principally of fat. In the latter there is scarcely a trace of bile, or the latter may be absent altogether.

Mucus.—Mucus is always present in all healthy stools and is so well mixed with the stool that it does not appear as mucus to the naked eye. Any appearance therefore of mucus easily visible should be regarded as abnormal. Mucus is present in every form of intestinal disease. Very abundant in inflammatory conditions affecting the large intestine, more so than in those affections of the small intestine, and especially so in inflammatory conditions of the colon, both acute and chronic.

Jelly-like masses.—Jelly-like masses of shreds of mucus, and where the stool consists chiefly of mucus, show that the affection is confined to the lower portion of the colon or that it is located in the rectum.

Long shreds of mucus.—Long shreds of mucus, frequently resembling false membrane, are often found in catarrh of the large intestine. If the shreds of mucus are intimately mixed with the stool, then we must look for the lesion quite high up, and if it comes from the small intestine it is usually stained from bile. If the lesion is low down the mucus is not intimately mingled with the stool.

Dyspeptic stool.—The first change noticed in the dyspeptic stool is the increase of fat. Often the stool is quite green and contains small pieces, of yellowish-white color, which vary in size from that of a pin-head to the size of an ordinary pea. Hitherto, from their color, they were supposed to be casein lumps. Wegscheider has taught us that they consist principally of fat. Baginsky has shown that large colonies of bacteria are contained in these lumps of fat. Frequently they are so numerous that it looks as though the stool were composed only of these cheesy lumps. They can be easily differentiated from real casein lumps by their solubility in alcohol and ether.

Fat diarrhea.—Biedert and Demme have devoted considerable attention to this subject. (See Biedert "Fett-Diarrhea" in "Jahrbuch für Kinderheilkunde," 1878). In some children the feces showed 50 to 60 per cent. of fat, whereas the normal percentage in ordinary feces varied from 13.9 per cent. (which is the normal quantity) according to Uffelmann.

Casein is not nearly as common an ingredient of feces as is commonly supposed, as I have previously stated. Casein lumps can be seen in abundance in the course of a diarrhea during an exclusive diet of milk.

Quantity of feces.—The quantity of feces varies, but it has been found that 100 grams of milk food will produce about 3 grams of feces, according to Baginsky. This is a vital point, but I have found it very difficult to determine, for in most cases the napkins of the infants are soiled with urine plus the feces, thus adding to the gross weight.

Proteids.—The proteids of milk are so thoroughly absorbed that only small traces of them can be found in the feces. Normal milk feces contain large quantities of bacteria, but chiefly two kinds, previously mentioned, viz., bacterium lactis aerogenes (Escherich) and bacterium coli commune. Other germs, especially those of the protolytic type (*i. e.*, those that render gelatin fluid) are not found under normal conditions.

Albuminous decomposition and its products, tyrosin, indol, phenol and skatol, are not found in milk feces. But lactic acid, acetic acid, formic acid and other fatty acids are present, causing the acid reaction.

Saccharine ferment.—V. Jaksch found a saccharine ferment in the feces of children.

Peptonizing ferment.—Baginsky found a peptonizing ferment also in infantile feces.

Escherich in "Jahrbuch für Kinderheilkunde," "Beiträge zur Antiseptichen Behandlungs-methode der Magen-Darmkrankheiten des Säuglingsalters" says: If albuminous decomposition with very foul offensive stools exists, these articles should be withheld from the diet and carbohydrates given, dextrin foods, sugars and milk. If acid fermentation is present, with sour but not offensive stools, carbohydrates are to be withheld and albuminous foods given, such as animal broths, bouillon, peptones, etc. In the decomposition of milk, the sugar of milk and not the casein is usually broken up.

Holt ("Artificial Feeding," p. 179) says: Regarding the exact indications according to which fat, sugar and proteids of milk are to be varied, much remains to be learned.

Sugar is too low.—If the sugar is too low the gain in weight is apt to be slower than when furnished in proper amount.

Sugar in excess.—Symptoms indicating an excess of sugar: Colic or thin green very acid stools, sometimes causing irritation of the buttocks; sometimes there is regurgitation of food and eructations of gas.

Excess of fat.—Excess of fat is indicated by the frequent regurgitation of food in small quantities, usually one or two hours after feeding. Sometimes an excess of fat causes very frequent passages very nearly normal in appearance. In some cases the stools contain small round lumps somewhat resembling

casein, but really masses of fat. This has already been mentioned in speaking of the differentiation of true casein curds and small fat lumps by the solubility of the latter in alcohol or ether.

Dry pasty stools.—When too little fat is given, it is indicated by hard dry pasty stools, and usually constipation. This can be easily remedied by the addition of cream three-fifths of which is fat. Holt speaks against increasing the fat above 4.5 per cent. in infants under six months old, and believes we should not go above 4 per cent. The following case is presented to illustrate the difficulties encountered in the ordinary feeding of a healthy child.

N. R., a healthy female, was put, soon after birth, on modified milk.

October 14.—Fat, 2.0; milk sugar, 5.0; albuminoids, 0.75; lime water, 1-16. Eight feedings; 2 ounces in each.

October 17. Constipation.—Fat, 2.5; milk sugar, 6.0; albumin, 1.0; lime water, 1-16. Nine feedings; 2½ ounces in each.

October 27.—Fat, 3.0; milk sugar, 6.0; albuminoids, 1.0; lime water, 1-16; barley jelly, 1-15. Ten feedings; 3 ounces in each.

November 5.—Fat, 3.5; milk sugar, 6.0; albuminoids, 1.0; lime water, 1-16; barley jelly, 1-15. Ten feedings; 3 ounces in each.

November 17.—Fat, 4.0; milk sugar, 6.0; albuminoids, 1.5; lime water, 1-20; no barley. Ten feedings; 3 ounces in each.

November 19. Curded stools, dyspeptic diarrhea.—Fat, 4.0; milk sugar, 6.5; albuminoids, 1.0; lime water, 1-20. Ten feedings; 3 ounces in each.

The child did not increase in weight, had a rectal temperature of 100 degrees, slightly furred tongue, vomited curds, had greenish stools containing undigested particles of fat and true casein, and large masses of mucus. The diagnosis of dyspepsia infantum was made. Hand feeding was stopped. The child's alimentary tract was cleaned by giving cascara sagrada, and a proper wet nurse was secured. The infant was now about 6 weeks old. The child nursed well and improved in weight and the character of stools was changed. The child improved until it was 7 months old, when it did not increase in weight. As the child was bright and otherwise cheerful, it was decided to have the milk of the wet nurse examined by a competent chemist. Through the courtesy of John S. Adriance, the chemist of the Nursery and Child's Hospital, I found the following: Fat, 2.000 per cent.; sugar, 7.431 per cent.; proteids, .882 per cent.; ash, .162 per cent.; total solids, 10.475 per cent.; water, 89.525 per cent.; specific gravity at 70 degrees F., 1.0316; reaction alkaline.

In the result above given it is very evident that a deficiency in proteids exists, hence it accounted for the late dentition and also for the stationary weight. The child did not gain an ounce in one month. We discharged the wet nurse.

I ordered: Milk, 3 ounces; cream, 2 teaspoonfuls; oatmeal jelly, 3 ounces; lime water, 1 dram; milk-sugar, 1 teaspoonful; one pinch of salt; sterilize and feed every three hours.

The child has taken this food for six days and I was pleased to learn at the time of writing that the child is cheerful, takes the bottle very well, has had one and two yellow stools daily, and has gained six ounces in six days. Thus we must adapt our food to suit each individual body; for, this infant did so poorly on modified milk and did very well on a wet nurse for a given time. It shows that the chemic examination should be made at least once a month, and at once if we find the baby not increasing in weight, or the character of the stools abnormal.

Proteids in excess.—Proteids in excess are indicated by the presence of curds in the stools. This is the most frequent cause of colic in infants. Sometimes there is diarrhea, more often constipation when the proteids are in excess. This excess of proteids frequently causes vomiting and so does an excess of both fat or sugar. If, therefore, after reducing the percentage of proteids, fat and sugar, vomiting still persists, then we must feed the baby with smaller quantities. Thus we may have to give a four ounce bottle where a six ounce or a five ounce feeding causes vomiting. Certain rules can be laid down; if an infant does not thrive, *i. e.*, does not gain in weight without showing any signs of indigestion, then the proportions, *i. e.*, percentages of all ingredients, should be gradually increased, chiefly the proteids, however, for the latter is the most important element in an infant's food.

Adriance after an examination of breast milk, both clinically and chemically, arrived at the following conclusions:

1. The fat shows no constant changes during lactation. Its most marked characteristic is its variability.
2. The carbohydrate on the second day of lactation is low, but it rises rapidly during the first few days; this increase continues, but less rapidly up to the end of lactation.
3. The proteids pursue a course the reverse of the carbohydrates.
4. The salts diminish similarly to the proteids.
5. The total solids are represented by 12.20 per cent. till the later months of lactation when they decrease steadily.
6. The colostrum period has low carbohydrates with a tendency to decrease rapidly.
7. The milk of the later months of lactation shows a deficiency in proteids and total solids.

The moment, then, that we find the baby not increasing in weight, or apparently hungry, the milk should be carefully examined for its proteids, and if the milk is deficient in this latter element then weaning must be insisted upon, for the proteids are the prime factors in infancy needed for growth, and deficiency therein will result in rickets and lay a foundation for all those conditions commonly called tuberculous.

The amylolytic function usually develops after the eighth or ninth month, at times toward the end of the first year; then starchy foods are called for, for the child's function can now transform this starch into sugar. The cereals should be given and Jacobi's plan, oatmeal where constipation or a tendency thereto exists, and barley or rice where a tendency toward diarrhea or loose bowels exists, is the most successful. To permit the indiscriminate use of cereals or to allow all patent foods to be given according as they are labeled is wrong, and many a case of rickets could have been avoided by a careful study of the infant's diet.

Condensed cream.—Hundreds of children in apparent good health appear at the children's department of the various institutions with which I am connected. I have examined them and find some in excellent health with no sign of rickets, then again hundreds appear with the same form of food and show the worst kind of rickets. Thus, while some thrive on a given food others do not. So condensed cream will be lauded by the mother whose baby is well, and again the same food will be condemned by the mother of an infant whose rickety head, bones and muscles are founded on an impoverished diet of condensed

milk. We can account for the rickety child, but we can not account for the healthy one on the same food.

Modified milk—While modified milk as it exists in the Walker-Gordon Laboratory has its advantages, much remains to be accomplished. For people who can not be relied on to properly sterilize or Pasteurize their milk, the laboratory will be beneficial. I have given the milk a careful trial in some of my best families and can not give it an indiscriminate recommendation. Constipation of the worst form was encountered in the child of a physician for whom I prescribed Walker-Gordon milk, and this proved so obstinate, although I modified the prescription by increasing the fat and lowering the proteids, that we finally abandoned it. This baby, fed on oatmeal and milk combined with a sterile albumin water, made a complete recovery without medication. Another child, also the child of a physician, for whom I prescribed modified milk, encountered this obstinate constipation and I finally abandoned this form of feeding and tried Mellin's Food, which agreed quite well with it. It is evident that in giving any form of feeding we must study the result. As each child is different in appearance so also are the requirements totally different. We must not overlook individual idiosyncrasies, for what will agree with one baby must not necessarily agree with another.

The microscopic examination of human milk.—Rotch says (page 169): Microscopic examination of milk is of value for the determination of the presence of pus, blood, epithelial cells, colostrum corpuscles and foreign matter. But the chemic analysis is the only one which can be depended on, for although the microscope may show yellow coloring matter and apparently be rich in fat, it may be misleading and not always prove so by a chemic examination. Thus, human milk of a green color (evidently produced by micro-organisms) may not even show under the microscope.

Specimen of breast milk for the chemist.—To obtain a specimen of breast milk for analysis, wash the hands so that they are sterile, and the breast and nipple with sterilized water, from 20 to 30 c.c. (5 to 8 drams) of milk drawn by the breast-pump, which being made of glass can be thoroughly washed, is poured into a sterilized bottle and tightly corked. The milk should be put on ice until the chemist is ready for the examination.

Both quality and quantity requisite.—Chemic analysis is not all; although the analysis may show the milk to be of an excellent quality an infant may not thrive owing to an insufficient quantity. The symptoms showing a deficient supply of milk being that the breasts at the time of nursing are soft and that only a small quantity can be extracted from them at the nursing time. A period of nursing longer than usual (which is fifteen or rarely twenty minutes) should lead us to suspect the milk to be lacking in quantity. We can also determine the actual quantity a child has swallowed by weighing it immediately before and after the nursing.

If we have habitual colic reduce the percentage of proteids; if frequent vomiting soon after feeding, reduce the quantity of each feeding. For regurgitation of sour masses of food, reduce the fat and sometimes also the proteids. For obstinate constipation increase the fat, also the proteids.

Rachitis.—Rickets is caused by an improper quantity and quality of food. It is evidenced by constipation or by hard pasty stools in early infancy. Unless the food elements are altered to modify this condition it is manifested by late dentition or by the appearance of carious teeth; the bony structures are not firm; the muscles are flabby; in some instances the children are fat. Examinations of a large number of children have shown that it is not the fatty elements but the lack of proteids upon which this rachitic condition is based. When children placed on starchy foods show constipation it is to be considered a danger signal that the food is improper. It is only too plainly evident that we must individualize and can not lay down general rules and each case should be considered separately.

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DISCUSSION ON PAPERS OF DRS. COTTON AND FISCHER.

Dr. J. P. CROZER GRIFFITH of Philadelphia—One of the things I have maintained strongly is the necessity of feeding the child at the mother's breast when it is at all possible to do so. At first thought this might seem altogether unnecessary, but still we know of physicians who make it a practice to wean the child very quickly when there is no necessity for it, maintaining it can be fed just as well on the bottle. It is true the child may be fed well on the bottle, but nobody can tell whether a child will do well on a bottle. Leaving the mother out of the question, there is no good reason for weaning the child unless it has to be weaned, and so I think it is well for us to consider whether or not we can not modify the mother's milk before we consider weaning the child. Next is the idea of having the prepared milk of the same percentage as in the mother's milk. The two substances are not alike. Although they may have the percentage the same, of different proteids, still we have different substances in the cow's milk and human milk. So it does not follow that 1 per cent. of albuminoids in the cow's milk will be digested as well as 1 per cent. of albuminoids in the mother's milk. We must try to determine what percentage of the different constituents the child will take and that often can be told only by trial. So to be on the safe side we should begin with percentages distinctly lower than we will expect the child to take. We as physicians must not forget that we are dealing with a living organism and not a machine, and we must not force our children too much to be fed. That is one danger of our modification of milk which we must uphold. Therefore we must be ready to make any changes necessary to sustain the individual case.

Dr. W. S. CHRISTOPHER of Chicago—The subject is altogether too large to discuss more than one phase of it in detail. I would especially direct attention to a point brought out, that is that condensed milk has a use. I have found there are conditions under which condensed milk is absolutely essential if life is to be saved. The dangers of condensed milk we will all admit. That it is a milk deficient in fat and proteids and that it leads to the production of scurvy and rickets we all know, but it need not lead to those things in the hands of those who know how to prevent them. Backing up the use of it with cod-liver oil and beef juice and some fruit juice for the antiscorbutic use, we have a food that is almost perfect. We find children who require condensed milk to avoid the poisonous effects from cow's milk, poisonous not in the sense that the milk is infected, but even pure milk will produce in the system of some children a substance apparently toxic which they can not bear. So I have had to take children from the breast and put them on condensed milk, when their trouble would immediately cease. The indications for the use of condensed milk appear to be these: I use it in children who have a predisposition to vomiting, so called "spitting babies." It is given not for the purpose of keeping the food down, but these children seem to have less of their disturbance when fed on condensed milk. It has been my experience to take children from modified milk, for instance, in which the albuminoids had been cut down almost to starvation and the fats greatly reduced to stop vomiting, and the form of albuminoid that could be borne was found in condensed milk. When condensed milk is not borne I have sometimes found that dried milk is. First I would give a sterilized milk and second a milk that has been boiled and the coagulum removed.

CHAIRMAN—Doctor will you tell us what you mean by sterilized milk?

Dr. CHRISTOPHER—I refer to one in which a temperature as near 212 degrees as possible is used. When we boil it we can remove the coagulum, and I think in the coagulum there is removed from the milk a substance which tends to produce these irregular features in children. If this is not sufficient, condensed milk will be frequently found satisfactory. If not, then resort to dried food, Nestle's food or what not, and in this shape the albuminoids are rendered indigestible and can not be absorbed by the child and consequently escape it. In not only the "spitting child," but also in the child that has a tendency to the formation of gas on the stomach, eruptions on the skin or catarrhal affections, this type of food will do better than raw milk.

Dr. T. M. ROTCH of Boston—The more advances made in infant feeding the less I feel I know about it. The greatest advancement in infant feeding, I think, is that we are getting rid of the old effete ideas about it, the fears that came up about the use of cow's milk, and we have in their place an instrument that we can use, an instrument which is exact, an instrument which in the future will save the lives of a great many children. I think the fault of infant feeding lies in the physicians themselves. We do not know how to use, for instance, the different percentages. We are just in the very infancy of our knowledge. The exact modification of milk is in embryo; it is not old. In former days they modified milk by mixing cream and milk, and they do now, but that in no way compares with the exact percentages we will deal with in the future. Now we can get those exact percentages and we are just beginning to use them. After we have used them five or six years we shall be more exact in our knowledge. But to say the children can not digest the lower percentages I think is not exact and is incorrect. I was much interested in Dr. Cotton's remarks. It is important to know the quantity of fat. It seems to me that in the future the busy physician will not make the analyses himself; I think it will be left for experts to say what are the percentages, and the physician will learn to think and speak in percentages. We will know, after experimenting with exact percentages given by exact analyses, which very few of us can make, for the physician in general can not make them, and then we will simply give the percentage we desire, for instance, the three of fat, six of sugar, perhaps, and one of proteids. These will be sent to people we know will put them up exactly, just as we now do our prescriptions of drugs. If you follow the history of the giving of drugs it corresponds with the history of prescribing milk. My great grandfather in Pennsylvania, for instance, used a mortar, which I have, to compound his drugs, that we now have put up by the apothecary, and in the future I think we will send to the laboratory our prescriptions for infant food, which are much more difficult to write than are the prescriptions for drugs in disease. But it is important, as the Doctor has said, for us to get them until we have confidence in the laboratory as we have in the apothecary shop.

Then as to mother's milk. There is nothing definite known about the analysis of mother's milk. Good human breast milk differs in percentage. So a child may do well when nursed by its mother but may have indigestion when given to a wet-nurse, not that the milk is not good, but because it is not adapted to the use of the special infant. It is in the variety of the milk in which lies its virtue and not in its exact percentage, and so we must vary our foods over and over again for the special child. It is not in any one component part but in the general composition of the food. For instance, in the formula Dr. Cotton has given us the 4.50 is entirely out of proportion with the .50. I can not tell the exact proportion, but with the proper combination of the different constituents we can make use of the albuminoids which exist in cow's milk.

Dr. JAS. J. CONCANON of New York—I have had to look over something like three or four thousand children every year and I have been accustomed to the fact that nearly every kind of artificial food will fail in many cases. The mother's milk is not only different in different women, as Dr. Rotch has said, but it varies in the same woman according to her condition and according to her diet. The various things referred to have all been tried in my practice, the use of fruit juice to prevent scurvy and the use of barley water when the child will not retain the milk. In many cases when the cow's milk will fail they supply a want and the child thrives. I do not know how it is throughout the country, but in New York we can easily obtain goats, for there we have a large Irish population. The subject of working up artificial infant foods is largely overdone. We ought to try more to compel mothers to nurse their children. I think about one-fifth of the children artificially fed are fed so because mothers will not nurse them, but give up nursing at the end of the second month for various reasons. Some believe they do not give the child sufficient and the breasts dry up. There is one thing you can never put in an artificial food and that is the antitoxic property in the mother's milk. We all know, who have anything to do with diphtheria, that the nursing child at the mother's breast is immune. I always, when immunizing for diphtheria, let the child go without an immunizing dose when it is nursing under nine months. After the tenth month the milk loses this quality. This you can not get in the artificial foods.

Dr. KELLEY, of Ohio—I would like to inquire of Dr. Cotton how he determines clinically when to add more fat and when to reduce the fat; when to add albuminoids and when to reduce the albuminoids, and so on with the sugar? How does he determine the quantities and whether they are right or wrong?

Dr. COLEMAN of Alabama—I believe the day will come when thousands of infants will be saved to humanity by the food advised by the able authorities today. But now I wish to speak more especially to the gentlemen situated in the country districts and in towns with 10,000 or less inhabitants. These proportions are the things we want. If we can get our modified cow's milk with cream or bicarbonate of soda or a pancreatic extract, that is what we want. But there is another thing that stress has not been laid on here and that is the manner of feeding the infant. More harm arises from the contamination of the milk after the family gets it in their hands before the child gets it into its stomach than we can imagine. If we can impress the importance of exercising extreme care in handling the milk, then we have done much for our patients. I do not think it is right to feed the child with a spoon and cup altogether, but when the infant is three months of age we can greatly eliminate the dangers of the nursing-bottle, and especially the use of the long nursing-tubes.

Dr. EDWIN ROSENTHAL of Philadelphia—I would like Dr. Rotch to answer a few questions. How about children who are partly fed by the breast? How should we proceed with them? And another thing, is the method pursued by our grandmothers, the method of burning the milk and using flour which has been changed by fire? I begin with a child only one day old by giving it half milk and half water. I rarely use sugar in any shape or form; I have not used it in either of my own two children. I use for the taste a little cinnamon. Albumin I use in any kind of dose; this I give raw, as much as an egg every hour or two, in water, to an infant of three or four months, and I mix with this albumin, salt. In regard to the formula by Dr. Cotton, I have always made my proportions in tablespoonful doses. It would be well to know how to prescribe the metric system in that way. I would like to know how much he considers the two eggs to represent. Among a certain class of people they use a preparation they call *zweiback*. Oatmeal water I have seen given to children, but a good many of them become scorbutic. One case, which I fed on sterilized milk, became rickety.

Dr. T. M. ROTCH of Boston—In the present state of our knowledge in regard to the feeding of infants during the first year of life it is not necessary to discuss the various artificial foods which have been given in the past. It is accepted by the medical profession that human breast milk, when of proper quality and adapted to the especial infant, is the best food that can be given to infants, and that when this food can not be given, cow's milk, modified so as to approach as nearly as possible human breast milk, should be used.

In regard to what Dr. Cotton has said concerning certain infants not being able to digest the proteids of cow's milk, and his advice as to the substitution of egg albumin, I would say that in past years, before the opportunity was given to modify the proteids in cow's milk for the especial case, I also had much difficulty in making certain infants digest the proteids of cow's milk. I have also given egg albumin in the manner in which Dr. Cotton has suggested. At the present time, however, I meet with fewer and fewer cases where the proteids can not be given, and this is due to the fact that through the newer methods for the proper modification of milk in all its constituents we can in the vast majority of cases adapt such milk to the infant's digestion, even when its digestion has been weakened by improper foods. I do not believe that there is any especial virtue in the albumin of eggs, and I am not aware that a sufficient essential chemic difference has been shown to exist between such albumin and that of cow's milk to warrant our substituting it for the proteids of cow's milk. We know that the coagulable part of the proteids of cow's milk is proportionately greater to the non-coagulable than is the case with human milk, and that, therefore, it is wiser to give a proportionately smaller amount of proteids to an infant who has difficulty in digesting the proteids of cow's milk, in comparison with the

percentage of proteids which the infant would receive in human milk. I should also draw your attention to the fact that it often is not the proteids which are disturbing the infant's digestion, but the improper combination of the fat, sugar, and proteids, which by adjusting more carefully will often agree with the infant, while the same percentage of proteids without proper adjustment would apparently cause disturbance of digestion.

Dr. Cotton has shown us a very valuable addition to the means which can be employed by the physician for preparing a substitute food for the infant in that he has shown us an apparatus by which the percentage of fat in the milk can be determined very easily. This is a step in the right direction, as it is the fat which varies so greatly in milk and wherever we can find the exact percentages of the different elements of milk, and can combine them in such a way that their exact percentages in the combination shall be known, is always valuable. I would suggest, however, that history repeats itself, and that the modification of milk by the physician himself, and in the family, will in the future probably fall into disuse, just as the combining of drugs in the physician's office has been mostly done away with. The milk laboratory will take the same place in the community as does the apothecary shop, and in the future the physician will find it both an instrument of precision and a means of saving time and labor for himself.

In regard to what Dr. Christopher has said concerning condensed milk being of vital importance for certain infants, I think that the experience of most of us has shown, and future investigations will show, that such a position as he takes is incorrect. In the first place he is not dealing with exact percentages when he gives condensed milk to infants, since the different brands of condensed milk vary very considerably; for instance, the percentage of fat varying from 2 to 28 per cent. There may be other reasons, as he has stated, for using condensed milk, but the very fact that the proper adjustment of the percentages is well known to be so important in the management of difficult digestion will in the future relegate condensed milk for the feeding of infants to the position of a food which has not proved satisfactory to the physician at large.

In regard to what Dr. Cotton asks as to the indications for increasing the fats, proteids, etc., I would say that it is well to begin with a low percentage of both fat, sugar, and proteids, and when the infant is digesting this combination well, to increase the percentages gradually until the infant shows that it is not only digesting the food but that it is getting a sufficient quantity of the elements for its nutrition by increasing in weight. Through means of the laboratory we are able to give any percentage of any of the three constituents of the milk, the fat, the sugar, or the proteids, which we wish and also to give them in any combination which we wish. Having this instrument of precision to work with we must, by noting our successes and our failures, elaborate a more complete system of treating the various phases of infantile indigestion than any we now possess, for we have none of us used the laboratory long enough to be able to say definitely in each case whether any one of these constituents should be increased or diminished.

Dr. BYERS of Alabama—I should like to ask Dr. Rotch what he regards as the normal standard of mother's milk?

Dr. ROTCH—That is obtained by averages, but you can not deal with averages when you are feeding an infant. You have to take the individual. You may take fifteen infants and change them to the breasts of other women, and you will find they will not do well.

QUESTION—Do you use the average as the standard and get the constituents from that average?

ANSWER—That is the trouble; we do not know the percentage in the individual case.

Dr. EDWIN E. GRAHAM of Philadelphia—I have discussed this subject with a number of physicians in Philadelphia and they all seem to be verging the conclusion arrived at by Dr. Rotch, that the more they use of milk from the laboratories the more persistently they stick to certain percentages for certain ages and vary those within certain limits, the better are the results they obtain. This conclusion I think has been forced upon them, because the feeding of the child by the laboratory method is certainly neither the most convenient nor the most economic. It involves an amount of study that is out of proportion to what physicians as a rule are in the habit of giving the subject, and it involves an amount of time that could very well be devoted to other subjects. Still the fact that physicians all over the country are adopting the method, and the sale of this modified milk is rapidly increasing, tends to show that the trend of modern opinion is toward the use of modified milk, modified according to definite methods.

Dr. J. A. LARRABEE of Louisville—I have listened with a great deal of interest to the subject of infant feeding, but I will not take up your time unnecessarily with the points already gone over. The whole thing seems to show too much science. I doubt if we shall ever formulate rules that will apply to all cases. What is one's meat is another's poison, is a better rule than any other we know. What agrees admirably with one child will not agree with another; it is a matter of speculation and individuality in each case. If we hit it right we do well, but we will shoot no worse if we aim at a mark. So it is well to have formulated plans. But I think we can never prepare a food of which we can say, "Go and give this to your baby and it will be all right." As to goat's milk, I do not know why that should be a panacea. It is true the goats may feed on newspapers and the infant may acquire an immense amount of literature in that way. The higher the goats climb, perhaps the more casein the infant may get. We all know the climbing nature of the goat; and nobody would be foolish enough to rent a level pasture for his cows if he wants to make cheese. I should say that goat's milk, instead of being a panacea at all for infants, will be better suited to those who raise goats; because it is said a penitentiary diet is good for penitentiary people. As to the immunizing property, I think the Doctor has the wrong idea. The immunity in these cases comes from the infant not getting the germs. If the baby is nursed at the breast and the breasts are kept clean, the child probably will not get the infectious disease that may be prevailing in the neighborhood, showing that the entrance of these micro-organisms is largely through the alimentary canal.

The reason I asked Dr. Christopher the question I did is that a temperature above 212 degrees appears to me to devitalize and take out of the protoplasm in the milk what we want, and we can certainly render it sterile at a much lower temperature. Even in the face of fat and adipose tissue, the child may develop scorbutus for the want of an element that is lacking. When the baby is nursing from the mother's milk, it is drawing other things than milk, and other than microbes; but as life gives life, and iron sharpeneth iron, so the mother's milk, being a living substance, tends to prevent scorbutus, and the lack of it predisposes to scorbutus.

Dr. T. M. ROTCH of Boston—All I can say in answer to the gentleman is that we have some who will digest 3, but will take 1 and 2 badly. Let the fat be anywhere up to 4 and the sugar up to 7, and you can make hundreds of thousands of combinations with these figures. But it is only once in many cases that you will need to change to get the proper combination for an individual case. In the vast majority of cases you will find everything will go well. It is in the difficult cases that I find the greatest success in making these different combinations. I used condensed milk for years and made as good food as I could. All these things I have been over and so I can speak with reference to them. Some one has asked if there is not a difference in the analyses of mother's milk. In reply I would say that there is a trivial difference.

Dr. A. C. COTTON of Chicago.—In regard to the indication clinically for the increase or diminution of the various ingredients, I tried to slip that over to Dr. Rotch, but he dodged me. Now what am I to do? He said, never mind the egg but go on and trust to God and Rotch and you will get along all right. I acknowledge him as the father of this business, you will understand; but I am somewhat like the man whose lawyers told him to go ahead. "But," he said, "they will put me in jail." The lawyers told him they couldn't put him in jail. "But," he said, "I *am* in jail." Now we have gone ahead, by his advice, as long as we could, but we have had to do something else. The dairymen tell us to go ahead and they will feed their cows so well that their milk will melt in the babies' mouth, but it *don't* melt. Dr. Rotch reminds us of the artist when he was asked what he mixed his colors with. He said he mixed them with brains. Dr. Rotch has not answered your question and I will not try to answer it. The babies have indigestible casein when I give them cow's milk, no difference what the laboratory men may say about giving milk that will melt in the mouth. When I add egg albumin they do very well. Then, under these circumstances, what shall I do? Hold to Rotch and lose my patient? In reply to the question as to how much and when, let me illustrate. I used to be a good sailor. Somebody asks, how hard to lean against the tiller and how hard to pull the sheet, and how hard to put the helm up? Why, how many things does that depend upon? You can not get the analysis of the mother's milk from the chemist and go and have something made exactly like it. You must feel your way along, just as the laparotomist must do when he examines the adhesions. But there are certain physiologic conditions that are well known. You know when a baby is rickety and scorbutic, and when he has tympany and indigestion he is not doing well, and you must feel your way along to get results.

INFANTILE CONSTIPATION.

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BY J. WELLINGTON BYERS, M.D.

CHARLOTTE, N. C.

The purpose of this paper is to present some observations bearing upon that form of habitual constipation in infants which is, as I conceive it, associated with if not ascribable to defective conditions connected with the digestion and assimilation of certain elements in the food.

There are some reasons of an anatomic and physiologic character, why we would naturally expect to find constipation in infants of frequent occurrence. The muscular structure of the infant bowel is feeble and thin, and possesses but little capacity to propel the feces onward when they have once assumed consistency and bulk. The descending colon of the child is also longer than other parts of this bowel and readily permits of dilatation and sagging when there are accumulations within. From these physical and anatomic causes, together with the fact that the intestinal juices in general are very much lessened in children, we can easily perceive how constipation may be common in this class of subjects. I do not, however, desire to emphasize any of these agencies in the causation of the disease, but to point out others which to my mind constitute the chief factors in the production of constipation in infants.

So far as my own experience leads me, I have found infantile constipation to be almost exclusively associated with a purely milk diet and that nurslings were the most common of all. I have also noticed that the constipated baby of these nursing mothers received an overplus of milk as far as the abundance was concerned. In other words, that a baby getting too much milk was destined to suffer sooner or later from constipation. In the second class, in point of occurrence, came the infants fed upon sterilized or boiled milk, and the least of all were babies who were nourished on raw cow's milk or a mixed diet of starch and milk.

From this experience the conclusion came to me that there must be a real connection between the milk diet and constipation; that in some way the one caused the other. At first view, influenced by prevalent teachings on the subject, I was prepossessed with the idea that the casein in the milk was the disturbing factor. As long as I remained subject to this view I made but little progress in understanding the cases and had no results in their cure. You are doubtless familiar with characteristic stools passed in this condition when the baby is upon an exclusive diet of milk. They are the basis upon which has been erected the previous treatment of the disorder. A superficial examination of the stool shows it to be composed of large masses of whitish-gray ashy-colored substance which has been designated casein. Most authors transcribing from one another have so denominated these masses, and the statements have remained on record more from a failure to corroborate than their accuracy. It was considered perfectly natural that the baby living upon milk would ingest more casein than it could digest and that these masses which came away in the stools were this surplus casein. The masses, moreover, were usually yellowish in their centers when crushed open and frequently manifested a cheesy odor. A failure to carry the examination farther has given rise to a number of false premises and bad methods. When these lumps are taken and placed in an open-mouth vessel, such as an ordinary pickle bottle, and sufficient sulphuric ether poured in to properly cover them and the vessel then shaken for a little while, these masses so long regarded as undigested casein will have disappeared and there is formed an emulsified product, proving their nature to be fatty and not proteid. Having in this way finally settled the nature of these stools beyond dispute, it became necessary to carry the thought and investigation still farther in order to ascertain the cause of this excessive passage of the fat and the failure of the organism to appropriate it. Clinical experiences in other conditions of the digestive tract will aid us here. It has been shown repeatedly that the very first step in the decline of the digestive functions of the child was an increase in the amount of the fat in the stools; that the primary stage in dyspeptic infants is failure to use fat.

It was Wegscheider who pointed out several years ago, and Holt has incorporated the statement in his work, that the little yellowish masses passed in the stools of dyspeptic infants were not casein, as commonly thought, but fat. In the constipation with which I am now dealing there is an impairment of the agencies concerned either in the digestion or assimilation of fat, or both. The fat appears as the chief constituent of the stool because of its rejection or failure to be appropriated. It produces constipation by its mechanical effects and the muscular impairment dependent on the contingencies of general malnutrition due to fat deprivation.

A large part of the so-called infant foods, or food attenuants, have been brought before the profession because of the supposed capacities to antagonize and modify what has been considered as casein. We should ever keep in mind the great fact that the real test of any food is not its digestibility, however important this may be, but the ability of the patient to assimilate and use it.

You are familiar with the fact that too little fat in the food will eventually be followed by the rickety condition. In attempting to form an adequate explanation of the condition I am now discussing, I believe we must turn to rickets to get a proper solution of these cases. You have all doubtless observed that the constipated baby is also subject to head and neck perspirations during sleep, that it has late opened fontanelles, cuts its teeth later than usual, and suffers also from bronchial disease and coryzas, has stridulus and resists disease of an acute character very poorly, although they are usually quite healthy in appearance or even fat. All of these symptoms point to rickets.

Another important, yet totally distinct cause which convinces me that the relations between the disorders is more than a mere analogy, and that constipation of this kind is really a phase of rickets, is that manifested in connection with the successful therapeusis of the cases. The treatment of both is essentially identical in character. What will aid constipation will also aid rickets. The formula devised by Dr. Lewis Smith, composed of cod-liver oil and lactophosphate of lime, when given to these children has invariably, in my hands, cured them and stopped the accumulations in the bowels. The ingredients of the prescription are not directed to conditions existing in the bowel or for their laxative effects, though I am not sure that the distinguished author saw the same

relations which I now am attempting to point out. I believe the effect of cod-liver oil is to raise the nutritory changes of the child's tissues to a state where they will resume the assimilation of the fat taken in the milk. I do not consider the oil as chiefly beneficial because of its direct action as a laxative upon the bowels, for which purpose it is frequently given, though it does have some influence in this way. It to my mind promotes nutrition in a way which enables the child to use the food which is so essential to its health, which it before treated as a foreign substance to be rejected.

Summary.—I have attempted to show that the constipated stool of the infant is fat, and not casein as commonly taught; that the fat accumulates in the stools because of its non-assimilation by the organism; that this failure to appropriate the fat was evidence of the presence of rickets as shown by the corroborating symptoms; that the disorder was amenable to a therapeusis identical with rickets and the process of cure was one of restoring the powers of fat assimilation.

SOME CASES OF TUBERCULAR MENINGITIS.

Presented to the Section on Diseases of Children, at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, June 1–4, 1897.

BY ANNIE S. DANIEL, M.D.

NEW YORK, N. Y.

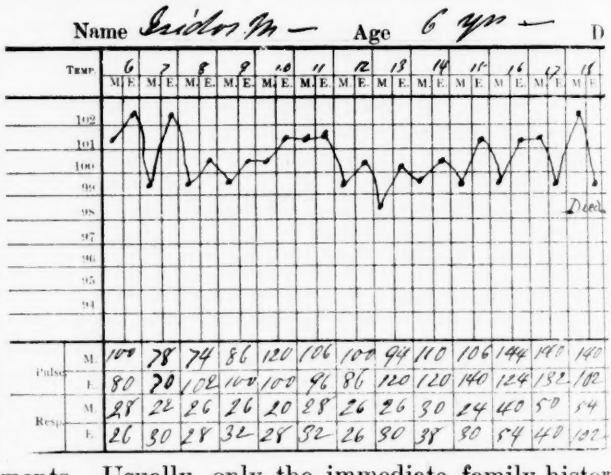
Since the first description of tubercular meningitis by Whyt, in 1768, the disease has been studied and described by a legion of authors, and yet today the most experienced diagnostician finds difficulty in arriving at a correct, early diagnosis. The invariable fatality of the disease is recognized both by parents and physicians and increases the obligation of not regarding the early symptoms of no importance, or ascribing them to a gastric catarrh or nervousness. Fortunately, the life of the patient does not depend on an early recognition of the disease, for as yet no remedy has been discovered which if given either early or late in the disease can in any way affect its course. We can not depend on one symptom, but rather on a group, of at times irregular symptoms, to base a diagnosis. The younger the child the greater difficulty. A known exposure to tubercular infection or tuberculosis of bones or other parts of the body, may attract the attention, and thus lesson the difficulty. Lumbar puncture and withdrawal of fluid has not as yet yielded brilliant results. In the three undoubted cases in which I have employed it, the result was negative. It is an easy and harmless procedure.

I have forty-nine cases of tubercular meningitis, studied within the past six years, to present to you. Of this number twenty-nine were under two years of age, twenty over. Nine cases were confirmed by autopsy; six of these under two years, three over. Of those under two years of age, seven had been directly exposed to tubercular infection; four of those over two years. All of the forty-nine cases were fatal. No case is presented in which there was a resonable doubt that the diagnosis was not correct. In children under two years, the diagnosis was based on the following symptoms: A sudden spasm or spasmodic movements followed by automatic motions of arms or legs or of both, paralysis, anesthesia, irregular pupils, retracted and rigid head, a doughy sensation upon palpation of abdomen, with outline of intestines marked through the abdominal wall, marked lengthening in the height of the child, coma and death after a brief illness. In none of the cases under two years was there found a prodromal period of ill health preceding the acute onset. In those over two years old the prodromal period was the rule, the length of time after the acute symptoms longer and the subacute rather than acute course of the disease marked points of difference. The prodromal symptoms were the usual malaise, or marked change in the disposition of the child, causeless vomiting and obstinate constipation.

The ages under two years were: Four months, one case; 6 months, two cases; 8 months, two cases; 9 months, three cases; 10 months, two cases; 1 year, three cases; 13 months, six cases; 16 months, three cases; 17 months, one case; 19 months, two cases; 20 months, one case; 22 months, three cases. Ages over two years: 2½ years, three cases; 3½ years, ten cases; 4 years, three cases; 5 years, one case; 6 years, two cases; 9 years, one case.

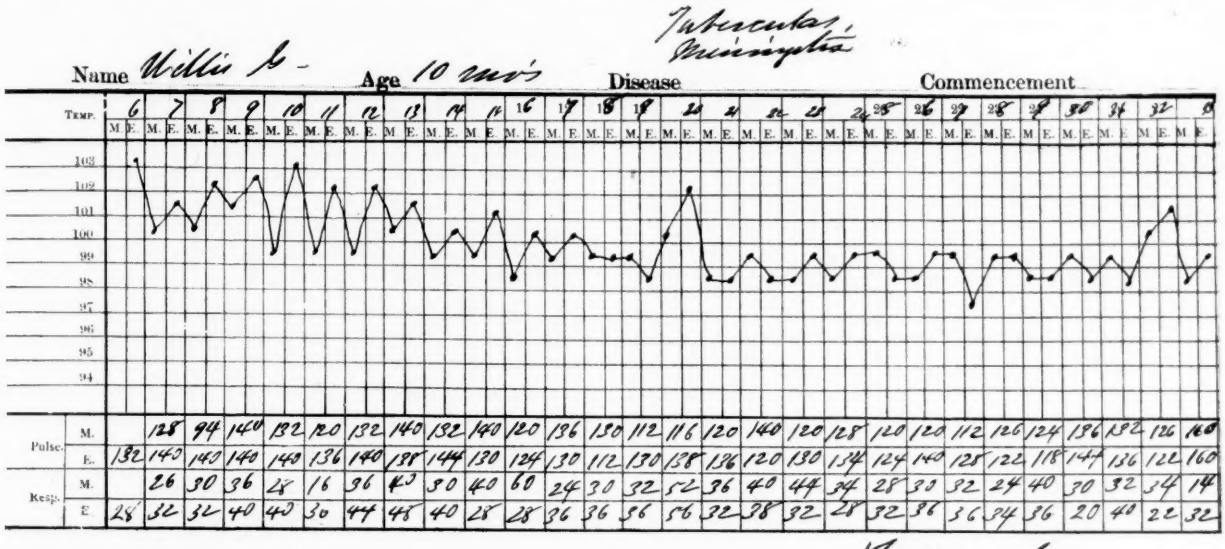
The sexes under two years were: Boys, seventeen cases, girls twelve cases over two years: Boys fifteen cases, girls five cases.

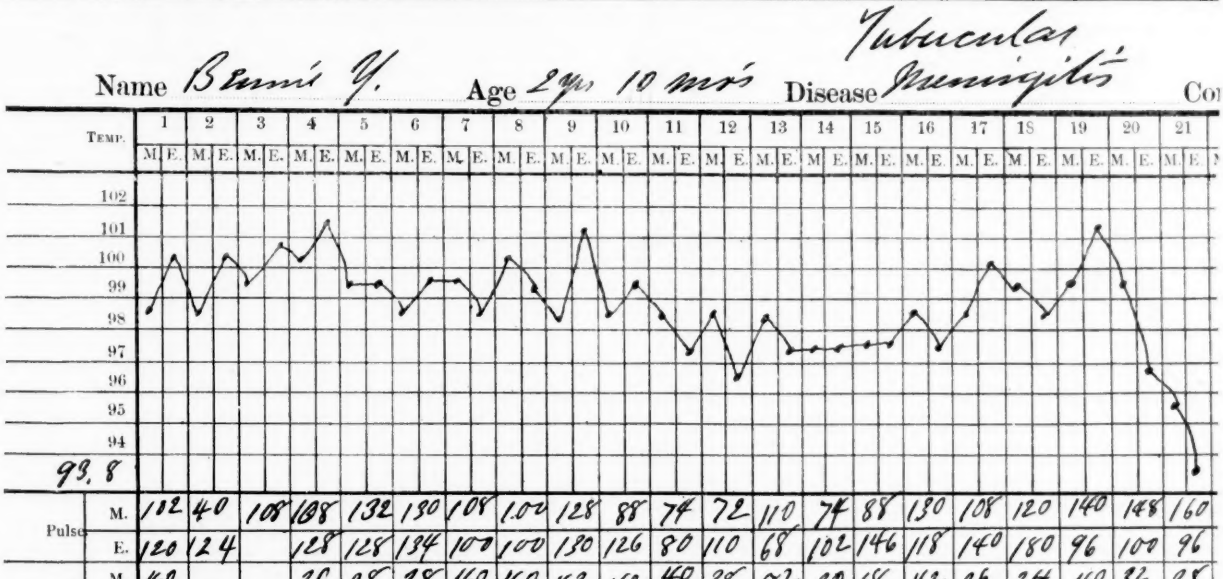
All the children lived in the overcrowded "East Side" of New York, none with even moderately good sanitary surroundings, and some in very bad tenements. Usually, only the immediate family history could be obtained. Of those under two years old, fourteen were children of healthy parentage; one was unknown, a foundling child; two had mothers with pulmonary tuberculosis; the fathers of four were tubercular; the father of one was insane; the fathers of three were chronic alcoholics. Of four both parents were alcoholic; in five cases other members of the family had had hip-joint or other tubercular bone lesions. In those cases where the parents had pulmonary tuberculosis the presence of the tubercle bacilli was confirmed in most of the cases. Of those over two years of age, the mother of one only had tuberculosis; both parents of one were tubercular; the fathers of five were chronic inebriates; both parents of one, inebriates; twelve had healthy parents; there was tubercular disease in the other members of the families of eight children. I think that the only significance of the alcoholism was the fact that the children had less care, less food, and lived in more unhealthy surroundings.



The previous medical history of the patients is of some importance. Of those under two years, five had had measles at intervals varying from six months to six weeks, but had apparently entirely recovered at

the time of the fatal illness; one had had congenital syphilis followed by rachitis; one had never been strong, but nothing further or more definite could be ascertained; one had had rheumatism; five had had attacks of bronchitis, while eight had had attacks of gastro-intestinal trouble; one had what the mother described as a "terrible temper," the remaining twelve had never been sick, but had been considered perfectly healthy children. Of the patients over two years old, eight had had measles at periods varying from two weeks to one year, all of whom had been





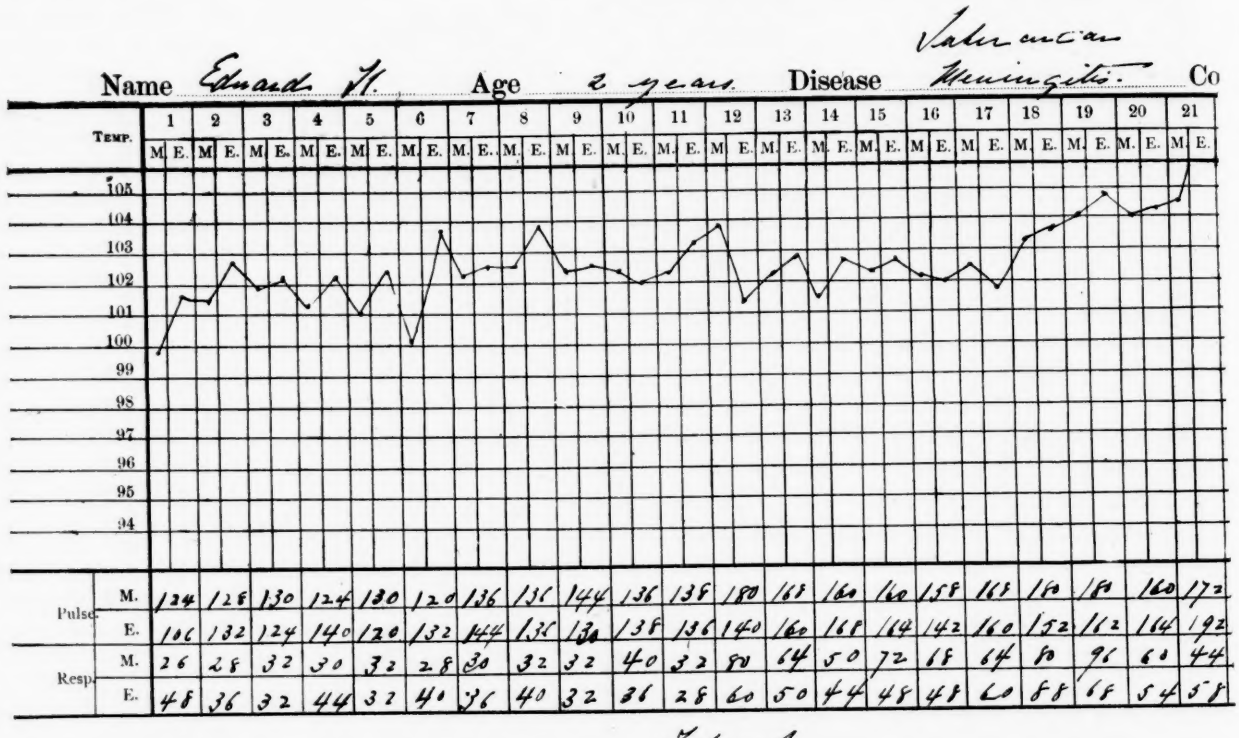
thought to have completely recovered; one had had scarlet fever four months before; three had had tubercular bone disease for periods varying from seven months to nine years, before the meningeal symptoms; of these two were caries of the vertebræ and one ankle-joint disease; one had had laryngeal diphtheria treated with antitoxin and tracheotomy three months before the meningitis but had recovered completely; six had never been ill.

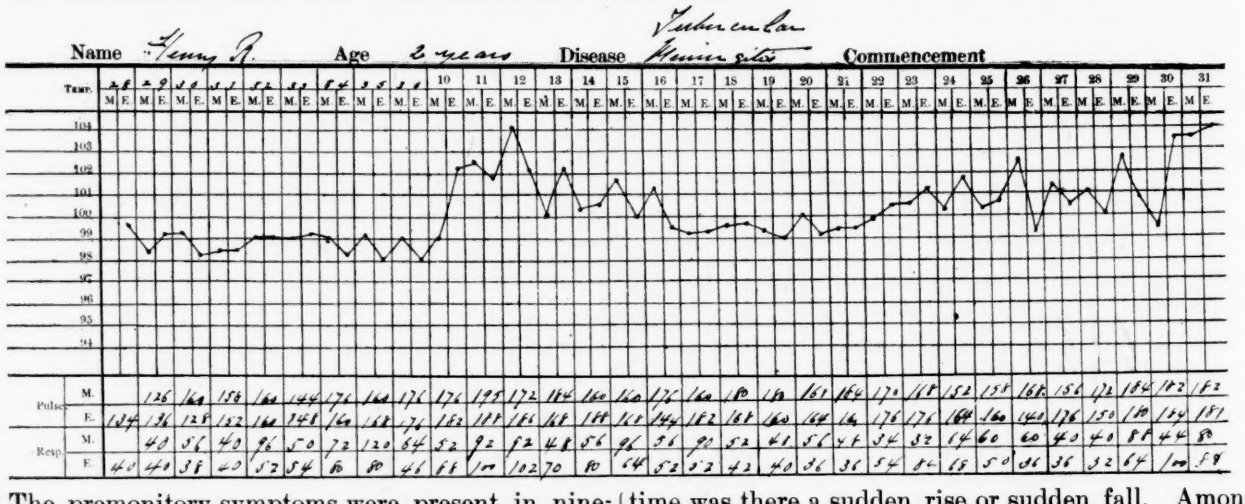
The smaller number of previously healthy children would be expected among children over two years old. Many of the text-books still lay much stress on the history of a fall as the immediate cause of the malady. I believe that in the majority of cases the fall is the result of the disease and not the cause. In but three cases could a history of a fall be obtained. One under two years had fallen from a chair three days before the spasm; one 4 years old had fallen from a high chair and was found to have fever at the time. This occurred three weeks before death; the child soon after the fall became drowsy and was from that time considered very sick; the other child, 2½ years old, had apparently stumbled and fallen down three small steps eleven weeks before death; this fall introduced the premonitory symptoms of the disease. The child was pale immediately after the fall, and seemed dizzy, but for a few days after he seemed quite well; the mother remembered the fall only after diligent questioning. The child 10 months and the one 4 years old, seem to have fallen for no apparent reason unless a sudden giddiness, the first manifestation of the disease.

For the children under two years, medical aid was summoned for the spasm in nineteen cases; for automatic movements, two cases, the mother not having observed either a spasm or spasmodic movement; for a gradual stupidity in seven cases, and for fever in

one case. On examination at the first visit, nine were found to have a bronchial catarrh, thirteen gastro-intestinal catarrh. The other seven presented the more marked symptoms of stiffness and retro-action of the head, on which the diagnosis was at once suspected. For those over two years, medical aid was summoned for vomiting and constipation in nine cases; headache, three; child growing stupid, four; spasm, in three cases only; one case developed while child was under observation in the infirmary for ankle-joint disease.

this occurring in the middle of the attack in a child nine months old; a mustard bath apparently reduced the temperature to 103. The lowest average temperature was 96.2. As all but one of the children were seen in tenement houses the temperature was taken only two or three times in the twenty-four hours. One of the children ten months old was admitted to the hospital on the sixth day of the disease; the temperature taken every two hours showed fever for ten days, after that normal or subnormal. The highest temperature recorded for this child was 103.4. At no





The premonitory symptoms were present in nineteen of twenty children over two years of age. Constipation and vomiting present as a marked symptom in the premonitory stage in nine cases. In those under two years, vomiting was present in nineteen cases, absent in ten, constipation present in seven, diarrhea in three, normal stools in nineteen. In those over two years, vomiting was present at some period in all the children and constipation in seventeen cases, the bowels normal in only two cases.

In those under two years, the highest average temperature recorded was 103.2, the highest 109 degrees, time was there a sudden rise or sudden fall. Among the children over two years, six were observed in the hospital, and the temperature taken either every hour or every two hours. The highest average temperature in those over two years was 102, the highest 107, this toward the end. The lowest average temperature was 99, the lowest recorded 93, near death. A boy aged 4 years and 7 months, who entered the infirmary with symptoms of malaise and had had three spasms, seemed very well on entrance except that the abdomen was flat, not retracted. The temperature was normal for three days, then an evening rise of tem-

perature to 101, but with no cerebral symptoms until four days later when there was stiffness and retraction of the head, four days later convulsions and continued high fever for four days more, and death with a temperature of 106.4. A boy 6 years old who entered the infirmary on the sixth day after the initial symptom of headache and died thirteen days later, had at no time a temperature higher than 102. A boy 2 years and 10 months old, admitted with an empyema, on the seventeenth day after admittance became drowsy as the first cerebral symptom, with a temperature of 102, and during the eighteen days that he lived after the cerebral symptoms appeared the temperature rose only ten times higher than 99, varying betweeen 93 and 99. Another boy, 2 years old, entered the infirmary for ankle-joint disease, seemed well in every other respect for four months, then cross, and evening rise of temperature without apparent reason. After the first evening rise the temperature continued elevated without either sudden rise or sudden falls until death twenty days later. A child 2 years old, who entered in the fifth week after the initial symptom of changed disposition, upon admittance presented well-marked symptoms of the disease, and did not have a temperature higher than 99, until sixth day after admission, then an evening rise to 102; two days later there was a sudden rise of 4 degrees and an equally sudden fall, the temperature being at 4 A.M., 100.9; at 5 A.M., 104.2; at 6 A.M., 100. At no other time did the temperature rise higher than 102 until twenty-four hours before death, twenty-one days after the sudden rise. There seems to be, from a study of the forty-nine cases, nothing characteristic about the temperature, except that higher temperatures are more uniformly met with in children under two years of age than over. There are rarely sudden rises or sudden falls of internal temperature. Toward the end of the disease in children over two years there was found sudden rises of surface temperature, this occurring after the child became semicomatose. That an early rise of temperature is not an early symptom of the disease in children over two years old, is demonstrated by the fact that medical aid is rarely called because a child has had fever; under two years fever as an early manifestation is more common.

Much importance is attached to the pulse rate in both early and late stages of the disease. In those under two years old, the pulse was found to be 160 in nine cases, as the highest; in one case only was it lower than 100. The highest lowest pulse was 140, the lowest 80. As the normal pulse under two years varies with the age and at two years should be about 110, very little reliance as a symptom can be attached to the pulse rate unless it is continually very rapid or continually very slow. A child ten months and six days old, after the first symptom of ill health, was admitted to the infirmary with a temperature of 103.4, pulse 132 and respiration 46. In this case, at this observation, the pulse rate was too low for the temperature and the respiration; the pulse was taken day and night every two hours for twenty-seven days, during which time the highest was 160; it was less than 100 but four times. Irregularity of the pulse in those under two years old, is not as frequent as in children over two years. Twenty-nine cases which could not be observed more frequently than these were, can not be relied on as infallible guides, or even aid in the diagnosis, but the twenty cases in the other children equally well observed, presented at some time an irregular pulse, while under two years the pulse rate is more uniformly higher and regular. In those over two years the reverse was found, the highest pulse rate being found in the later stages of the disease and at all stages more or less irregular. The highest pulse rate noted was in a child over two years old, 180. The lowest of the highest recorded was 80; the highest of the lowest was 120, the lowest 60. In a child 2 years old, the first of the observations of the pulse taken in the fifth week after the initial premonitory symptoms, and who was semicomatose and lived thirty days after his entrance, the pulse was rarely regular, lowest at 80, and there were very frequent rapid rising and falling of the pulse rate, without reference to the time of day, to the temperature or to the respiration. An instance of this: Temperature 99.4, pulse 180, respiration 52; temperature 101.2, pulse 188, respiration 100. In the case of the child 2 years old, entering with ankle-joint disease, the temperature, pulse and respiration were in normal proportions, and was under close observation for four months preceding the tubercular meningitis. During the month preceding the first symptoms of changed disposition, the pulse was never higher than 128 or lower than 100, except on two occasions. The temperature which had not risen higher than 100, at the beginning of the changed disposition was 101; the pulse was 108 and respiration 40. After that, during the twenty days the child lived, the pulse fell to or below 100 five times and usually out of proportion to the temperature and respiration; at one time 103.6, pulse 100, respiration 40; two hours later, 103.6, pulse 132, respiration 36. This observation was made six days after the first symptom of changed disposition. On the last day of life the temperature at one time was again 103.6, the pulse 168, respiration 32. The twenty cases over two years old, while presenting the irregularity usually observed, did not present the slow pulse which is considered one of the pathognomonic signs of early tubercular meningitis. In children five years or over the slow pulse is much more apt to be found. A child 6 years old, seen the sixth day after the first symptom of ill health, had for four days, a pulse rate which on observation every two or three hours, only twice reached as high as 100; the lowest during these four days was 68, after the convulsions which occurred first on the sixth day of the disease and later on the twelfth day. The pulse at no time rose above 116. After the second spasm, which occurred when the pulse was 94, the pulse, with the exception of five observations on the day of the second spasm, never fell below 110. The pulse from the first observation was irregular. This symptom of an irregular pulse I believe to be of more importance than a simply slow pulse which may be found in other diseases.

In diagnostic value the respiration presents a more certain aid to the diagnosis than either the pulse or temperature. In those under two years it was in every case irregular early and the irregularity persisted to the end. The respirations were highest at the beginning of the disease, and slowest toward the end. There seems to be little or no ratio between pulse, temperature and respiration among the twenty-nine children under two years old. The highest number of respirations recorded were 90, the lowest 10. A marked typical Cheyne-Stokes' respiration was found in five of the twenty-nine cases. The irregularity consisted, usually, in at first a short pause

between the respirations, this pause becoming longer and more frequent as the disease advanced, the irregularity at times very regular; the number of respirations might be six, then a pause, then six more with another pause, this regularity in the irregular respiration becoming less and less marked as the disease advanced. At times there seemed to be a rapid increase or decrease in the number of respirations from hour to hour. The greatest increase and decrease was more often noticed from minute to minute, as in one instance it was 16 in one minute, 48 in the next. This usually occurs late in the disease, but it may occur at any time. The above observation was made on the eighteenth day after the first symptom of ill health and nineteen days before death. In those over two years old the highest respirations noted were 108; the lowest of the highest respirations were 27. The lowest respiration recorded was 7. All were irregular early and twelve presented a nearly characteristic Cheyne-Stokes' respiration. The fluctuations in the number of respirations to the minute are much less marked in those over two years, and the fluctuation from hour to hour less marked than in the younger child. The respirations become as a rule more rapid at the end of the disease. There is no ratio between the pulse temperature and respiration that can be relied on as occurring sufficiently often to be diagnostic, as at one time with a temperature of 104, pulse 180, respiration 96. Later in the same child on the same day, temperature 104, pulse 160, respiration 64. While the respiration leaves much to be desired as a pathognomonic symptom, the irregularity so almost constantly present early in the disease in the younger as well as in the older child makes the careful observation most important.

Many authorities place much stress on the symptom of an intermission in the acute symptoms, an apparent beginning recovery. In those under two years old this occurred three times in the twenty-nine cases. One at nine months was very marked, the child quite suddenly sitting up in the crib, playing. These symptoms lasted three days, during which time the only abnormal symptom was the irregular respirations. Two other cases had an intermission of twenty-four hours, during which time the child seemed to have regained the appetite, but appeared abnormally hungry. In those over two years, two only had an intermission of twenty-four hours, but during the premonitory stage there is marked variations; one day the child seems pretty well, then again drowsy or more cross, but the intermissions in the above cases occurred after the stiffness and retraction of the head had occurred and the diagnosis seemed very certain.

Among the twenty-nine children under two years, a positive diagnosis could be made early in only fifteen cases; these were the cases in which the stiffness and rigidity of the muscles of the neck were an early symptom. As tubercular meningitis in those over two years old more commonly begins at the base, the diagnosis was made early in twelve of the twenty cases, the early positive diagnosis being based on the stiff holding slightly backward of the head. The duration of the disease in the children under two years was an average length of fifteen and a fraction days, this from the first symptoms of ill health. The longest was twenty-six days, the shortest seven days. In those over two years, but not including the premonitory symptoms, which varied from two to three weeks, the average duration after the symptoms directly pointing to the meninges was twenty-one and a fraction days, the longest period, fifty-four days, the shortest ten days. Under two years, the differential diagnosis lay between simple meningitis, cerebro-spinal meningitis epidemic, and gastro-intestinal diseases.

Tubercular meningitis is a preventable disease, incurable when once contracted. It is not a local tuberculosis as tuberculosis of the lungs. On autopsy tubercles are more frequently found in other parts of the body. In all my cases in which there was a known source of contagion, the person from whom the disease had been contracted had pulmonary tuberculosis. The mode of infection was difficult to ascertain. It may have been through the respiratory or the gastro-intestinal tract. Most of the families where a tubercular patient was present were filthy, expectorating on the floor, rarely washing their hands, handling food and giving it to the children. It has been difficult to ascertain whether the children contracted the disease by drinking milk. A large quantity of milk is sold in the city where no examination is made to ascertain whether the cows are tubercular.

The older the child, the less danger there is among New York tenement house children of contracting the disease through milk, as children over two years drink very little, practically no milk. The treatment employed has been mustard paste applied as counter-irritant at the base of the brain, ice continually over the head, iodid of potassium given hourly, and indications for other treatment met as they arose.

THE CLINICAL IMPORTANCE OF THE EYE SYMPTOMS IN ARRIVING AT A DIAGNOSIS OF MENINGITIS IN CHILDREN.

Presented in the Section on Diseases of Children at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, Pa., June 1–4, 1897.

BY A. E. DAVIS, A.M., M.D.

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NEW YORK, N. Y.

In bringing the subject of diagnosis of meningitis in children before this Section of this learned society for consideration, it is for the purpose of specifically directing your attention to the eye symptoms in this disease and of their importance in arriving at a correct diagnosis.

In 1888, Swanzy,[1] in an instructive paper on the "Value of Eye Symptoms in the Localization of Brain Disease," was led to remark that "these eye symptoms are not as much valued as they should be, perhaps because their often subtle and sometimes subjective nature renders them less readily studied than are other focal brain symptoms." Also, that "eye symtoms are too often not looked for at first but utilized rather as a dernier ressort."

While no doubt the eyes and their symptoms in relation to all diseases have received much closer attention than formerly, it only too often happens that the general practitioner does not, until he has exhausted all other means, turn to the oculist for aid.

When it is remembered that many eye symptoms which are of great importance in meningitis are

[1] British Medical Journal, Nov. 17, 1888, pp. 1089-1095.

largely *motor* in character, that is, paralyses of the different eye muscles, the pupillary changes, ptosis, etc., all of which may be observed without the aid of the ophthalmoscope, ignorance of the use of which most practitioners give as an excuse for not making proper examinations of the eyes, it is only the more to be regretted that the eyes do not receive earlier and more careful attention. Even in lesions affecting the *visual* apparatus of the eyes, visual centers, optic tracts, optic nerves and retina, by means of the perimeter to take the fields of vision, a moderate degree of efficiency in the use of the ophthalmoscope, and with a careful study of the motor symptoms, a correct diagnosis can be made out in most cases. However, I am not unmindful of the difficulty and many times of the impossibility of making careful examinations of the eyes in children. For this very reason I wish to emphasize the necessity of making full use of the eye symptoms that are present, and not to pass them over as of little importance, as is often done.

In the first place, I want to give a brief résumé of thirty-eight cases of meningitis that were treated in the Post-graduate Hospital of New York City. Thirteen were simple or leptomeningitis, twelve were cerebrospinal meningitis, and thirteen were tubercular in character. Some of these cases never had their eyes examined with the ophthalmoscope and only cursory examination of the eyes at all, while some of them had their eyes examined one or more times with the ophthalmoscope, and others were examined systematically with the ophthalmoscope and otherwise for eye symptoms throughout their illness. Some of these cases were examined by myself.

On the whole, I would say that the examination of the eyes in these cases may be taken as a sample of the attention that the eyes usually get in cases of meningitis.

Of the thirteen cases of leptomeningitis, including under this heading one case of purulent meningitis, there were no eye symptoms in eight cases, or they were of such a trivial character as not to be noted. Strabismus was noted in two cases and the pupils were dilated in another. One case, a girl 4 years of age, who had been treated in the hospital a year previously for purpura hemorrhagica, and was cured in two weeks' time, is of enough interest to be reported briefly by itself. The patient was sick one week before entering the hospital, being greatly depressed, complaining of severe headache, vomiting and having no appetite whatever. She was feverish and voided but little urine. On the third day after entering the hospital I examined her eyes. The pupils were dilated, but responded quickly to light or irritation of the body. There was a neuroretinitis plainly marked in the left eye. The eyes were examined every third day until death, which occurred on the thirteenth day after the child entered the hospital and the twentieth day after the beginning of the illness. Just six hours before death there was a marked neuroretinitis in the left eye and a beginning one in the right eye; the pupils were widely dilated and irresponsive to light or peripheral irritation; and there was a small ulcer on the left cornea. The right hand was drawn across the chest and there was twitching of the fingers of that hand for six or eight hours before death. No postmortem was allowed.

In the case of purulent meningitis, in which there were no eye symptoms, postmortem examination showed the meninges covered with pus, and extensive adhesions between the pia and dura mater.

In the twelve cases of cerebrospinal meningitis, eye symptoms were absent in seven cases, or not noted. There was loss of iris reflex in one; in one, dilated and fixed pupils; in one, strabismus, and in one the pupils dilated but reacted to light.

Of the thirteen cases of tubercular meningitis no eye symptoms were noted in eight cases; while in one case the pupils were dilated, in one the left pupil only was dilated, in one there was ulcerative keratitis and conjunctivitis, and in one dilated pupils and lagophthalmos. No tubercular lesion of the eye was seen in any of the cases. Postmortem examination in most of the cases was obtained and confirmed the diagnosis.

Such is the brief history of these thirty-eight cases.

In order to make the eye symptoms of value in diagnosis in the different forms of meningitis, we should, where it is possible, first decide whether such symptoms are "primary" or "secondary;" that is, if the symptom, for example paralysis of the sixth nerve, is due to direct lesion in the nucleus or in the course of the nerve itself it would be "primary" in character; or if due to a lesion far removed, which affects the nerve indirectly through pressure or in disturbance of circulation, it would be "secondary" in nature. Secondly, we should distinguish clearly between the motor and visual disturbances in the organ of sight. It is unnecessary to tell you that the primary symptoms are much more important than secondary symptoms. Unfortunately, however, it many times takes days, or even weeks, to make a distinction between the two. It must be borne in mind also that diffuse symptoms, as general headaches, etc., are not of great importance when compared to focal symptoms.

CEREBROSPINAL MENINGITIS.

Before pointing out the significance of the eye symptoms separately I shall first enumerate them as a whole.

Motor symptoms.—Paralysis of the sixth nerve, third nerve (complete or partial), fourth nerve, ophthalmic division of the fifth nerve, seventh nerve (giving rise to lagophthalmos), conjugate deviation, nystagmus and ptosis, from cortical lesions.

Visual symptoms.—Choked disc, optic neuritis, perineuritis, plastic and suppurative choroiditis, iritis, conjunctivitis, edema of the lids, hemianopsia as a cortex or tract lesion, blindness. It is a peculiarity of cerebrospinal meningitis that the eye symptoms vary in different epidemics. For instance, one epidemic may be marked simply by a conjunctivitis of a more or less severe character;[2] in another the chief eye symptom may be characterized by plastic or suppurative choroiditis;[3] in another the cornea may be the seat of affection;[4] while in another the optic nerve and retina may be the chief points of trouble.[5] Nystagmus is a frequent symptom in some epidemics.[6] At times there are no eye symptoms whatever, but these are comparatively rare cases. Randolph,[5] in the report of forty cases, found but four cases without eye complications of some kind.

Paralysis of the sixth nerve.—Sixth nerve paralysis is one of the most common of the motor symptoms affecting the eye in cerebrospinal meningitis.

[2] Ziemssen and Hess: Klin. Monatsblat. für Augenheilkunde, 1865, p. 275, seq.
[3] Knapp: Centralb. f. med. Wissenschaften, No. 33, 1865.
[4] Wilson: Dublin Quarterly Journal of Medicine, Vol. xliii, 1867, pp. 302-6.
[5] Randolph: The Johns Hopkins Hospital Bulletin, No. 32, June and July, 1893.
[6] Leichtenstern: Deutsch. Med. Wochen., No. 31, 1885.

In an epidemic of twenty-nine cases observed by Leichtenstern[7], the external rectus was affected oftener than the other eye muscles. Randolph, on the other hand, in an epidemic reported by him, observed third nerve paralysis most frequently, eight cases out of forty having divergent strabismus, and the pupil being affected in nineteen out of the forty, while ptosis was noted but once and that unilateral.

Seventh nerve paralysis.—From pressure on the seventh nerve we may have the eyes remain half open, the child apparently not being able to close them.[8] From the exposure of the cornea from this cause ulcers may be formed on it, and for this reason such cases should have the eyes bathed frequently to keep the corneæ moist and, if necessary, a protective bandage should be applied.

Paralysis of the ophthalmic division of the fifth nerve.—From pressure on the fifth nerve we may have anesthesia of the cornea and a neuroparalytic keratitis may develop. On the other hand, from irritation of the fifth nerve, we may have paresthesia, or at times we may have hyperesthesia of the eyeball and lids, and a headache confined to the temple on the side affected. The fourth nerve is at times paralyzed, but this is infrequent.

Conjugate deviations.—Conjugate deviation of the eyes is sometimes seen, but usually it is a secondary symptom and is of short duration. Jaccoud[9] reports a case of conjugate deviation to the right in purulent meningitis of the left hemisphere and congestion of the right hemisphere. Conjugate deviation may be due either to lesion in the cortex or in the pons. In the former the deviation is toward the side with the lesion in paralysis and from it in spasm; just the reverse of this happens when the deviation is due to a lesion in the pons.

Ptosis.—Ptosis, unilateral or bilateral, has been observed in these cases. Randolph[10] found unilateral ptosis with divergent strabismus and dilated pupils in one case out of forty observed by him. In this instance, I would judge the lesion was in or near the corpora quadrigemina. Unilateral ptosis, as the only focal symptom, occurs in cortical lesions alone. Not infrequently, however, ptosis, single or double, occurs temporarily as a secondary symptom.

Nystagmus.—Nystagmus in some epidemics is frequent, as in the one observed by Leichtenstern,[11] while in others it is of rare occurrence. Randolph observed it in but one case in forty, and that was of an unusual kind, that is, the eye oscillated in the vertical meridian on the horizontal axis.

Visual symptoms. Optic neuritis.—Inflammation of the optic nerve occurs comparatively frequently in some epidemics and very rarely in others. Randolph[12] found it in six cases out of forty, and "great venous engorgement and tortuosity, with more or less congestion of the optic disc," in nineteen others, besides one case of hemorrhagic retinitis and thrombus of the central vein of the retina. Schirmer, quoted by Randolph, did not find it but once in an epidemic observed by him in Greifswald. Optic neuritis generally comes on late in the disease, but has been observed as early as the sixth day. When it does occur, and early, it is of vast importance in establishing a diagnosis, especially in sporadic cases where we are in doubt at times as to the correct diagnosis.

Neuroretinitis and *perineuritis* are other conditions similar in nature to optic neuritis, and at times are observed in these cases. So remarkable a condition as *choked disc* is comparatively rarely seen in this disease, more commonly in tubercular meningitis, and most commonly in brain abscesses and tumors of the brain.

Optic neuritis in meningitis may be caused indirectly by pressure from exudation and cell infiltration on the outside of the nerve. However, the nerve and its sheaths are frequently directly implicated by continuity of tissue. The optic disc has a more or less characteristic appearance in these cases, which is a certain "smoky" or cloudy appearance. Besides this smoky condition, the edges of the disc are indistinct or obscured altogether, there is more or less redness and at times, but rarely, hemorrhagic spots on it. Many times there is only congestion of the disc, while the veins are very tortuous and full of dark blood (Randolph, Mathewson, Andrews). The condition known as perineuritis (Galezowski) has been observed in this affection. It is characterized by a slight swelling at the periphery of the optic disc and a sinking in at its center and a moderate amount of redness, the retina presenting a grayish, striated appearance, or at times an edematous look. I have seen two such cases myself and take it to be simply a neuroretinitis.

Plastic and suppurative choroiditis.—Suppurative choroiditis with iritis and occlusion of the pupil, accompanied in some cases with hypopion, are the chief eye conditions in some epidemics.[13] Plastic choroiditis usually appears in the second or third week and, as a rule, causes destruction of sight. The fundus of the eye, from the plastic exudation in the vitreous, gives a grayish or yellowish reflex and simulates the appearance of glioma retinæ, or the so-called pseudo-glioma.

Panophthalmitis and a suppurative choroiditis may follow as a result of meningitis.

Hemianopsia.—This valuable focal symptom at times in cases of pachymeningitis, is here of no value. In the first place, because children are rarely affected with pachymeningitis, and, again, on account of the age of the patient, it usually could not be made use of.

Conjunctivitis.—Conjunctivitis and in several cases edema of the conjunctiva and the lids, are early symptoms and are important diagnostic conditions. The edema of the conjunctiva is due to the extension of the inflammation into the orbit along the veins and impeding the return flow of blood from the eyeball.

Photophobia is sometimes an early and marked symptom of this disease.

A few or many of the above eye symptoms may be present in cerebrospinal meningitis; at times, however, no eye symptoms at all are to be observed. The general symptoms in cerebrospinal meningitis, temperature, vomiting, headache, retracted head, spinal irritation, herpetic or petechial eruptions, taken together with the fact that it usually occurs in epidemics and in the winter or spring of the year, as a rule, make it easy of diagnosis without the aid of eye symptoms; but in sporadic cases where the general symptoms are not well marked and some of them absent altogether, the eye symptoms may be the chief factor establishing a correct diagnosis.

[7] Loc. cit.
[8] Loc. cit.
[9] Jahresb. f. Aug., 1879, p. 243 (quoted by Knies).
[10] Loc. cit.
[11] Deutsche Med. Woch., 31, 1885.
[12] Loc. cit.
[13] Knapp.

SIMPLE OR LEPTO-MENINGITIS.

The eye symptoms are of even more importance in determining the diagnosis in simple meningitis than in cerebrospinal. 1, Because it does not occur in epidemics. 2, because it is always secondary and its symptoms may be masked by the primary affection.

All of the eye symptoms that have been discussed in connection with the cerebrospinal meningitis may occur also in simple meningitis. The motor symptoms are of about equal frequency in each. But the most important eye symptom in these cases perhaps is optic neuritis. Not that it has a localizing value, or is of great value even of telling what the trouble is; but when present it points to brain complication and puts the physician on the right track. And as meningitis is one of the common causes of optic neuritis we should give it due heed, and by means of other symptoms in connection with it decide if meningitis is or is not present. I especially desire to call your attention in this connection to cases following middle ear and acute febrile affections.

Chronic suppuration of the middle ear was once and, I am afraid, is yet looked on as of little consequence when occurring in children, the child being expected to outgrow it. Fortunately extension of the inflammation to the brain in such cases is but of infrequent occurrence, but when meningitis does follow such a cause optic neuritis is almost invariably present, if not a choked disc "sometimes between edema and actual inflammation of the nerve."[14] And I may say here abscess of the brain and meningitis following suppurative inflammation of the middle ear have been treated for intestinal disorders, and that even where eye examinations have been made. Mathewson[15] has reported abscess of the brain with local meningitis in a little girl who had been treated by him, for chronic suppurative otitis and fistulous opening over the mastoid, for about three months and was apparently cured. Four months later, however, she was taken ill after she had "attended a children's party and was shortly after attacked with vomiting and headache and other symptoms which seemed to be due to gastric and hepatic disorder resulting from indigestion in eating and excitement." Mathewson saw the patient in consultation and was of the same opinion as the family physician, that it was gastric and hepatic disorder, and the child was treated accordingly. He saw the child again on the following day and he and the family physician remained of the same opinion as on the preceding day and the same treatment continued. The child died in convulsions on the second day. Dr. Mathewson made an examination with the ophthalmoscope, but it "showed no swelling of the optic nerve disc and the retinal vessels were not tortuous, though there was a peculiar dark color with some dilatation of the retinal veins which I shall always hereafter regard with suspicion." Autopsy showed "veins and sinuses filled with fluid blood, meninges injected, adhesions at points over the petrous portion of the temporal bone and an abscess containing an ounce or so of fetid pus in the left lobe of the cerebellum." As Mathewson says, the chief point of interest in this case was that the ear should give rise to abscess of the brain four months after it was apparently well.

Dr. Pooley[16] reports an interesting case of a boy 12 years of age who had brain abscess, sinus thrombosis and meningitis with marked eye symptoms as the result of chronic suppurative otitis in the left ear. The child had had a Wilde's incision performed six years previously, but a subacute condition remained and, when seen by Pooley, mastoiditis was present complicating the chronic otitis and the patient had high temperature. Dr. Pooley did a mastoid operation. The eyes were not examined till the fifth day, when a marked choked disc was present in the left eye with a contracted pupil. On the thirty-first day after his entrance into the hospital the patient was found to be blind in the right eye, apparently over the entire field. The ophthalmoscopic examination showed nothing in the right eye. However, on the following day the ophthalmoscope showed slight venous hyperemia on the right side and violent choked disc on the left side. The patient died on the forty-first day after entering the hospital. Pooley in one of the deductions from his paper says, "The intra-ocular end of the nerve is never inflamed when the disease remains limited to the middle ear and mastoid, but is a certain evidence of brain disease. If, therefore, optic neuritis is found, the diagnosis of extension to the brain is certain, no matter whether other evidence exists or not." And what I myself wish to emphasize is, that children do not outgrow chronic suppuration of the middle ear; and when a child is so troubled is taken with fever, severe headache, vomiting, etc., we should not be content with a diagnosis of intestinal disturbance but make a thorough examination, not omitting the eyes.

Another frequent cause of meningitis in children is by *metastasis* following acute infectious diseases, croupous pneumonia, etc., also from pyemia, septicemia, etc., and from the exanthematous diseases. Often, in these cases, some eye symptoms, as paralysis of one of its muscles or an optic neuritis, are the only symptoms pointing to a brain complication. Hence the great importance of having the eyes examined in such cases.

Optic neuritis occurring in these acute febrile diseases is nearly always consecutive to a complicating meningitis. However, it may occur without meningitis, as Stephenson[17] has reported a case of double optic neuritis following measles without meningitis.

In purulent meningitis, edema of the conjunctiva is at times an early symptom. This is brought about usually by an extension of the inflammation along the veins into the orbit, but it may extend along the sheaths of the optic nerve and may be the only eye symptom. At times, however, abscesses form in the orbit with exophthalmus and paralysis of one or more of the eye muscles. Also there may be edema of the lids, which is characteristic by it being confined almost wholly within the orbital rim.

Suppurative choroiditis with ciliary injection, iritis, exudation into the vitreous, infiltration in the cornea, and even panophthalmitis may be the result of purulent meningitis. And it must not be forgotten, on the part of the general practitioner, that a purulent affection of the eye (purulent choroiditis, panophthalmitis, etc.,) may be the focal point for a purulent meningitis.

TUBERCULAR MENINGITIS.

Tubercular meningitis is perhaps the most insidious disease of infancy and childhood, creeping on from day to day as it does in its prodromal stage and, even after the prodromal, often manifesting itself in irreg-

[14] Trans. Amer. Otol. Soc., 1883, Vol. 3, p. 155. [15] Loc. Cit.

[16] Transactions Amer. Laryng., Rhi. and Otol. Soc., 1896.
[17] Trans. Oph. Soc., Vol. 3, p. 250.

ular forms with, at times, many of the leading symptoms absent, it is almost impossible to make a correct diagnosis.

The eye symptoms in tubercular meningitis are the same as in the simple meningitis, but in rare cases in addition tubercle deposits may be seen in the choroid or iris, or both; and where tubercular masses form in the brain we may have symptoms of brain tumor present. Such a case was under my observation at the Post-Graduate Hospital and has already been reported by Professor Chapin in the February number of the *Archives of Pedriatics*, 1897. The eye symptoms in this case were nystagmus, dilated and fixed pupils and neuroretinitis in the right eye. The patient died, and the autopsy by Dr. Collins showed miliary tubercles scattered throughout the left lung and solidity of the left apex. There were three distinct tumors in the brain, the size of walnuts: 1, on the basilar surface of the left cerebellar lobe; 2, at the head of the caudate nucleus on the right side; 3, in the substance of the anterior and posterior quadrigeminal bodies. The nature of the growths were tubercular. The tumor on the under surface of the cerebellum seemed to be attached only to the pia.

Tubercle may affect the eyes primarily or secondarily, and in two ways; manifesting itself either in the form of small circular miliary deposits, grayish or yellowish-grey in color; or in masses varying in size from a split pea to half the size of the eyeball itself. When these tubercular deposits are present in the eye, especially when the other organs of the body, lungs, joints or glands, etc., are affected, they are of paramount value in determining the character of the meningitis. Tubercles are so seldom seen in the eye, however, that observers differ in their estimation of their value for diagnostic purposes. Especially rare are cases with tubercular deposits in the choroid in this country, but from the reports of Cohn and other European writers, tubercular deposits in the choroid are not very uncommon there. Tubercular iritis is a more common affection.

Bach[18] thinks tubercular infection of the eye to be quite common, and says that the optic nerve may have tubercular nodules on it as a result of tubercular meningitis and that the choroid may be acutely or chronically affected by the tubercle. The uveal tract is the most common seat of infection, but tubercles may appear on the lids, conjunctiva, cornea and lacrymal canals, and may be primary and the only symptom of the disease.

Valude,[19] from experiments on the rabbit, is of the opinion that the eye from its peculiar anatomic structure confines, on the one hand, tubercular lesions to itself in primary affections; and on the other hand, is slow to be infected by tubercle from other organs of the body. He thinks, as a consequence, that tubercular lesions of the uveal tract, iris, choroid, etc., are contracted not from within the body, but by external infection. He was led to this view by his experiments, which tended to show that tubercle germs are not carried by the blood vessels but by the lymph channels; and in the eye these channels are not so intimately connected with the general lymph channels as are the other organs of the body.

Minot lays but little stress on the choroidal appearances in tubercular meningitis and says: "Choroidal tubercles are so rarely seen as to be of little value in diagnosis. In fact, they are less frequent in this disease than in general tuberculosis without meningitis. In twenty-six cases of tubercular meningitis examined by Garlic at the London Hospital for Sick Children they were found only once."

Prof. Reynold W. Wilcox of New York City, tells me that in over two hundred ophthalmoscopic examinations for tubercles in the eyes of consumptives he did not find tubercle in a single case, and Prof. W. Oliver Moore of New York writes me as follows: "I have examined ophthalmoscopically the eyes of forty-one patients with different forms of tuberculosis, in the New York Hospital and also in the Charity Hospital. In twenty-eight patients the diagnosis was made and verified at postmortem, of acute miliary tuberculosis. In thirteen cases the diagnosis was tubercular meningitis and verified by postmortem. In only one eye out of the eighty-two eyes examined was there any approach to the appearance usually described as tubercle of the choroid. In this case what appeared to be a tubercle of the choroid was found postmortem to be a 'vacuole.' One case of general acute tuberculosis was observed among the forty-two cases. Unfortunately, in none of these cases were cultures made from the eyes. But in all, the postmortem examinations showed the usual tubercular deposits in the various other tissues. Tubercle of the iris I have seen frequently, having the records of twelve cases. Tubercle of the choroid is extremely rare in this country."

But undoubted cases of tubercular affection of the choroid both primary and secondary in character have been observed, as proved on microscopic examination and by reinoculation on rabbits and guinea-pigs, and by cultivation.

Three cases of primary tubercular affections of the uveal tract are reported by Denti and Rambolitti (*Annali di Ottalmologia*, June, 1895), one of which was cured, but the eye in the other two had to be enucleated. In the latter two cases some of the material from the enucleated eye was injected into the anterior chambers of the eyes of rabbits and guinea-pigs with development of characteristic tubercular iritis. Incidentally, at this point, I may say that the failure to obtain tubercle bacilli in the fluid after spinal puncture does not preclude tubercular meningitis, for if the eyes of rabbits be inoculated with the fluid it sometimes sets up a genuine tubercular iritis in which the tubercle bacilli are found, having developed from spores. Again, if this can not be practiced, cultures of the germs may be made from the fluid obtained from spinal puncture, though no tubercle bacilli could be detected in the spinal fluid.

On the value of the eye symptoms in the differential diagnosis of the different forms of meningitis, I do not lay great stress. I do not agree with Leichtenstern, that in tubercular meningitis we are apt to have the pupils dilated and sluggish oftener than in the epidemic forms of cerebrospinal meningitis. Neither do I agree with Nettleship, in the opinion that when the optic nerve is affected on the one side only it is on the same side as the meningeal affection if it is a true meningitis, but on the opposite side if of a tubercular character. In fact, I am inclined to side with Whittaker, "that the various forms of meningitis are to be separated and recognized more by the etiologic relations of the disease than by any difference in symptomatology."[20]

[18] Arch. f. Augenheilkun., Wiesbaden, December 1893.
[19] Arch. d'Opthal., Paris, May and June, 1892.
[20] Ref. Handbook, p. 721.

In conclusion, I would urge the systematic examination of the eyes of children, both for motor and visual symptoms, in all conditions simulating meningitis, especially in those cases where there has been a long standing middle ear suppuration, in cases of pneumonia, pyemia, empyema, septicemia, etc., and cases giving tubercular history and with glandular complications. At times in these cases the eye conditions are the only symptoms pointing conclusively to brain complication.

IMPAIRED VENTILATION AND DRAINAGE OF THE NOSE THE MOST COMMON CAUSES OF NASAL CATARRH.

Read before the Chicago Medical Society, Nov. 24, 1897.

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The physiology of the nose was, until recent years, but imperfectly understood. Text-books on physiology, of but little more than a quarter of a century ago, taught that the nose was the organ of smell and the passage through which respiration was conducted and nothing more. No hint was given that any effect upon the air was derived from its passage through the nose. No mention was made of the sounding-board influence of a patent nose upon the voice. In those days the pathology of nasal catarrh was quite in keeping with the meager knowledge extant as to the physiologic uses of the nose. The good old family physician then regarded nasal catarrh as being practically incurable and largely dependent on mal-condition of the stomach, or else a result of general poor health, and believed that the only treatment which would give promise of improvement or cure was vigorous internal medication of a powerful alterative and tonic character. Hence, as might be readily inferred, with such a faulty pathology, associated with such an imperfect idea as to the physiology of the nose, the treatment of nasal catarrh was so unsatisfactory that it became the opprobrium of the practice of medicine.

At last a change came in medicine as regards the nose, and its anatomy was more carefully studied. Advances were also made in the study of nasal physiology, and it was learned that the nasal fossæ were something more than simply two "blow holes" for convenience in respiration. Different investigators have independently made a careful study of the nose and, as their several results have in the main agreed, we now know approximately the form and character of a perfect nose, which, if even seldom met with, we should always keep in our mind's eye as an ideal standard. Our ideas of nasal physiology are also crystallized into a rational form.

In an ideal nose the two fossæ are identical in size. The septum is vertical and its walls nearly plane. It is not deformed by bony, cartilaginous or soft growths of exuberant tissue, rhinologically known as exostoses, enchondromata, etc. The turbinated bodies are of symmetrical shape, and in no case at any point should they touch the septum. Through the tortuous convolutions of these bodies the area of the nasal mucous membrane is materially increased. The inferior meatus should be clear and the inferior turbinal should never touch the floor of the nasal passage. The middle meatus should also be clear, meaning that at no point should the inferior and middle turbinals touch each other. The superior meatus should likewise be free and there should be enough free space for the so-called superior turbinal, and even for a fourth turbinal if such anomaly be present. This upper portion of the nose may be called the nasal attic and its proper shape and condition is of more importance in the consideration of nasal catarrh than has been generally appreciated.

Finally, as a result of the combination of the requirements noted, we find that in an ideal nose no two adjacent or opposing surfaces should ever touch each other at any point or at any time. The amount of free space required about the turbinal varies with its location. The turbinals may be regarded as erectile structures, the inferior possessing the power of distention to a marked degree, and hence requires more free space about it than does the middle turbinal, the most erectile portions of which are the inferior surface and posterior end. By anterior rhinoscopy a normal inferior turbinal is found to have about it, when most shrunken, a space of not less than one-eighth to three-sixteenths of an inch, while the space between the septum and the middle turbinal is about one-sixteenth of an inch. Such free space about the turbinals is required in order that they may have sufficient room in which to swell. When owing to growths upon the septum or to a deflection thereof, or any other cause or causes, such space is not given, contact, even if not continuous, occurs periodically or whenever swelling of the turbinals takes place. In this way is explained the great susceptibility of many patients to frequent attacks of coryza and also why stoppage of the nose is so often complained of when the patient is in the recumbent posture, which position tends to increase turbinal congestion. Contact in one nostril generally means contact at some point in the other nostril, hence alternating stenosis is frequently noted. When the nasal spaces are materially increased in size beyond the normal it causes the disadvantages of atrophy and is even a greater defect than is stenosis. When the two nares are unequal in size, one being stenosed, the other is compelled to do the greater part of the work and may be so overworked that it can not properly fulfill its physiologic functions. While secreting only enough nasal fluid to properly humidify one-half of the air inspired, it is giving entrance to much more than half of the air required; hence this air is not sufficiently humidified and, as it enters in a larger column, it is likewise not so well warmed. Furthermore the increased volume of air entering tends to dry the mucous membrane to an abnormal degree and is therefore harmful.

Through the mobility of the alæ nasi, in combination with those slight growths upon the cartilaginous septum which are so frequently met with, a certain degree of anterior stenosis is as often observed, being usually more pronounced during inspiration than during expiration. Anterior nasal stenosis tends to produce posterior congestion, for, when present, the air in the postnasal space during respiration is alternately rarified and condensed, the same as though it were being operated on by an air-pump, hence a hyperemia is kept up, which in time may result in posterior turbinal hypertrophies or posterior enlargements on the vomer. Varying air pressure in the postnasal space has long been recognized as being a frequent cause of Eustachian tubal congestion and catarrh. A stenosis of one nostril will frequently

cause a hyperemia of the other nostril, even though it be free from structural defect.

Connected with the nose by suitable openings are several accessory cavities, the perfect drainage of which is dependent on proper patency of the nasal meatuses and in fact of the entire nasal fossa. Physiologic research has established the fact that the most important function of the nose is to warm and humidify the air inspired. By being warmed the air is also slightly rarified. Of course it is additionally known that large particles of floating matter are caught by the hairs located near the external meatuses; that small particles of dust become attached to the mucous membrane through the tenacity of the nasal secretion and are in due time blown into the handkerchief; also that noxious vapors and gases cause sudden swelling of the turbinals, increase the flow of nasal secretion and often provoke protective sneezing.

In a healthy adult nose the quantity of the nasal secretion approximates one pint each twenty-four hours, being watery in character and of a specific gravity of about 1015°. The quantity mentioned, one pint, is none too great to properly humidify the large quantity of air inspired. Taking for an average eighteen respirations per minute we have 1,080 per hour, 25,920 per day, 9,467,280 per year, and so on through life, and, as at each breath in the adult male there is taken into the lungs on an average one pint or twenty cubic inches of air, we have twelve and one-half cubic feet per hour, 300 cubic feet per day and 109,575 cubic feet per annum, or enough to fill a cistern sixty feet square and over thirty feet in depth.

In order that this vast quantity of air may easily pass through the nose and be properly prepared for the lungs, it is essential that the nasal fossæ be free and unobstructed by deformities. If the requirements as previously given are fulfilled, viz., there being in every case a sufficient space between apposing surfaces, and in no case two apposing surfaces touching each other, the entering air will freely pass through all parts of the nasal fossa, including the deep recesses of the meatuses, so that every part thereof will be thoroughly and perfectly ventilated and, as a result, the nasal secretion will be continuously evaporated so there will be no opportunity for it to thicken and become a catarrhal discharge.

In addition to the prevention of evaporation through contact of two apposing surfaces, drainage is likewise at the same time impaired. Growths upon the septum, even when no contact exists, by destroying the symmetry of the passage interfere with drainage, particularly when the patient is in a recumbent posture, and in this way cause, through the accumulation of secretions at such points, a thickening thereof, which in turn prevents the required evaporation.

A second result of the touching of parts in the nasal passages is the production of a condition of inflammation of the membrane which in time becomes chronic, and which changes the character of the secretion, rendering the evaporation thereof more difficult, and thus increasing the tendency to catarrhal decomposition and discharge.

Through the increased sensitiveness associated with such inflammation we often have an explanation for the manifestations of hay-fever, asthma, etc., which, regardless of any concomitant uric acid condition, are best relieved by such surgical steps as will insure perfect intranasal ventilation and drainage.

The excitation of cold, or of dust, or any other irritating quality of the air being inspired, causes a swelling of the turbinals through a congestion of the capillaries of the same, which capillaries are larger than those in other parts. By being so congested the increased supply of blood gives increased heat and, furthermore, through the swelling the lumen of the passages is reduced in size, causing the air to pass through under great pressure and in a thinner column, so that it may be more thoroughly exposed to the heated turbinals. Simultaneously with the swelling of the turbinals, the nasal secretion becomes greater in quantity, so as to better humidify the air and attract the dust or cause its precipitation. Furthermore, evaporation of this secretion is more rapid, owing to the increased rapidity of the air current.

The ophthalmologist ever has in his mind the emmetropic eye, though such eyes are rarely to be met with. The refracting of abnormal eyes, and the surgical, or gymnastic correction by prisms, of muscle inequality or strain, are merely efforts to cause the defective eye to more nearly resemble the emmetropic standard. In the same way the duty of the rhinologist is, on the same principle, to cause the defective nose, as nearly as possible, to become patterned after the ideal standard, and in this way we have the key to the cure of nasal catarrh.

Chronic nasal catarrh is chiefly a structural disease and its cure generally consists in the removal of hypertrophied or pathologic tissue.

Meyer was one of the first to make a decided advance, and one of great import, when he published the result of his studies of adenoid hypertrophy, showing its causative effect in the production of both postnasal catarrh and trouble of the ears.

In a small percentage of cases, nasal catarrh is due to a catarrhal or empyemic condition of some one or other of the accessory cavities, though in my experience such conditions are invariably associated with other nasal defects wherein either some degree of hypertrophy impairs the ventilation and drainage of the fossa, or else a condition of atrophy is present, and therefore, in either event, presenting a structural change.

Atrophic degeneration, if not a sequela of the hypertrophic condition, is frequently found associated therewith, so often in fact that it would seem to be ample proof that atrophy is frequently a late stage of that which began as a hypertrophy. A frequent cause of atrophy is the presence of septum growths, against which unyielding points the opposing turbinal is caused to press each time it becomes distended until, after years of such restraint, its normal contractile elasticity is impaired and, through the irritation long kept up, hypertrophy follows, which in time is succeeded by pressure atrophy. Thus we see the result of nature's awkward effort to remedy the hypertrophy and stenosis. While nature is ever trying to correct defects, her aims should be anticipated and her footsteps guided, else she may go astray. As the condition of atrophy advances, the nostril gradually increases in caliber until it becomes abnormally large, and hence there is lost, to a corresponding degree, the physiologic property of moistening and warming the inspired air. Such secretions as are present, being too dense to evaporate, become incrusted and decomposed and frequently are instrumental in causing the breath to be offensive. In the treatment of atrophic rhinitis, while a return to normal structural form is seldom attained, the condition is greatly benefited by

following out the line of practice recommended in this paper, viz., the correction of all hypertrophic conditions existing so that all parts of the nasal fossa, meaning in this case particularly the attic, shall be thoroughly ventilated and drained.

Perforation of the nasal septum, even though the turbinals remain normal, produces the equivalent of atrophic rhinitis to the extent of the size of the perforation, and is an unfortunate structural deformity, which in the present state of the art is incurable.

It is not within the scope of this paper to attempt the consideration of the remote or primary causes of deformities of the bony or cartilaginous tissues of the nose. Some of the causes of hypertrophy of the soft tissues have already been touched upon, and among others may be mentioned recurrent attacks of coryza, induced by climatic changes generally, and particularly by those frequent and sudden changes from heat to cold and from dryness to humidity, so continuously made by going in and out of our modern overheated and too often poorly ventilated residences and public buildings. Additionally, dietetic irregularities, the wearing of cotton instead of woolen underwear, and many other customs of latter-day civilization may be cited as predisposing causes.

In this paper only the present condition of chronic nasal catarrh is being considered, coupled with nothing more specific than the general principles of treatment.

The correcting of nasal deformities is much like the remodeling of an old house. With a sufficient amount of patience and perseverance on the part of the patient, and of careful and systematic work on the part of the surgeon, results satisfactory to both will in a very large percentage of cases be obtained. It is far better that nasal defects be corrected early in life, and as soon as recognized, for in this way the kindly help of nature will be secured, and at a time before she, through misguided efforts to improve, has unfortunately done damage which will be difficult to remedy.

When the laity, as well as the rank and file of the profession, fully recognize the great import of nasal deformity, it will be quite as customary to have the rhinologist examine and correct the defects of the nose as it is now to make annual visits to the dentist in order that the teeth may be kept in perfect repair.

Conclusions:

1. That chronic nasal catarrh is chiefly a structural disease.

2. That impairment of ventilation and drainage of the nasal fossæ are the most important causative elements.

3. That the touching of apposing surfaces is one of the most important pathologic factors.

4. That the line of treatment is largely surgical and the chief object aimed at is to cause the defective nose to conform, as nearly as possible, to the shape of the ideal standard.

Columbus Memorial Building.

Paracentesis of the Tympanic Membrane.—Prof. J. Gruber incises for a collection of pus or serous fluid in the tympanum as for any abscess, and recommends his incision as the best, for several reasons. He commences in the upper posterior square of the tympanic membrane, and carries the incision forward around to and through the lower posterior square, following the arc of a circle, about 1 to 1.25 mm. from the edge of the auditory canal, with the convexity turned toward the rear.—*Wien. Klin. Rundschau*, October 17.

SURGERY ONE HUNDRED YEARS AGO.

AN HISTORICAL STUDY

BY DR. GEORGE FISCHER.

DEDICATED TO THE GERMAN SURGICAL ASSOCIATION.

TRANSLATED FOR THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATIO

BY CARL H. VON KLEIN, A.M., M.D.

XVIII.—DISEASES OF THE THROAT, CHEST AND ABDOMEN.

(*Continued from page 1165.*)

Foreign bodies in the esophagus were oftener pushed into the stomach than removed. If the first attempts failed a pause was allowed to ensue, during which antiphlogistic methods, means for allaying spasms and enemas were applied. The old folk's way of dealing a strong blow with the fist between the two shoulder-blades was also used by surgeons. For the removal of foreign bodies a curved hook made of strong wire sufficed (J. L. Petit), or a sponge for needles and (fish) bones. The sponge drawn with strong threads against the end of a tube was inserted in a dry condition, then water was injected through the tube, the tension of the threads relaxed a little so that the sponge expanded and then pulled against the sides of the tube so as to securely grasp the impediment. The old so-called stomach-brush was in use then (Heister). This, a soft brush fastened to a wire, was originally intended for freeing the stomach from mucus; it was moved upward and downward until no more mucus appeared. For propelling foreign substances downward, a whalebone to which a sponge was attached (J. L. Petit), and oil injections were used. Forcibly thrusting down the obstruction Lentin considered utterly inadmissible and recommended large pills of butter, dumplings and oil. An infinite number of forceps and ligatures were invented; Eckoldt constructed a whole instrumentarium of throat protectors, throat cages, throat sacks and throat buttons. That Habicot on account of great spasms of suffocation in connection with a foreign substance impacted in the esophagus was compelled to employ tracheotomy has been mentioned before. The last remedial agent that remained was the operation known as esophagotomy. First recommended by Verduc (1611), it seems then to have been used by Stenosen (Taranguet, Monnod). For the removal of a foreign body, Goursault (1738) made the first artificial opening of a man who had swallowed a bone by an incision into the most prominent part of the neck. Only once more during the past century was the operation of esophagotomy performed, by Roland for a similar purpose. Theoretically surgeons gave much time to it. Guattani in 1772 furnished the first complete description of it, designated the proper place for incising, made several operations on animals and saw that the wound healed easily. He advised an incision from the trachea to the sternum a little toward the left side, pulled the edges of the wound apart with dull hooks, then thrust his instrument into the interior on the left beside the trachea between the muscles, and so exposed the esophagus. If the foreign substance could be felt, the incision was made in that spot, otherwise the esophagus was carefully opened and with the aid of scissors on a hollow probe distended upward. In order to obtain a larger aperture and to prevent an injury to the nervus recurrens and the arteria thyroidea inferior, Eckoldt (1799) proposed an opening between the lower parts of the sterno-mastoid and thence to penetrate into the interior.

Foreign bodies that had made their way into the stomach and into the alimentay canal were often gotten rid of by making the patient swallow oily and mush-like foods and liquids. Schmucker in one case counted 120 needles, 150 nails, besides hairpins, pieces of glass, etc., which had been expelled through stools. If the offending body or bodies could not be pushed down and so pushed out of the system, an operation of gastrotomy had to be performed. It is known that one was successfully made on the peasant Grünheide of Koenigsberg. He had used the handle of a knife nineteen centimeters long to tickle the pharynx so as to cause vomiting, when he swallowed it. The members of the faculty examined him, after a prayer to God the patient was strapped on a board. The registrar of the faculty marked the place for the incision with a piece of charcoal, whereupon the surgeon, Daniel Schwabe, with a lithotome cut an opening of four fingers' breadth, and about a hand's breadth to the left of the umbilicus. After half an hour, fainting spells ensued and the patient was released from the board and then again bound to it. Attempts to draw forth the stomach with a pair of forceps in order to open it, failed. Then a thread was passed through it; by order of the registrar a hole was cut into it and Schwabe drew out the knife with the forceps. Five sutures were required, a bandage with warm balsam and recovery. The Leyden Museum still preserves the portrait of the peasant of Koenigsberg. The operation was performed in the past century by Hübner (in Rastenburg before 1720), and by Frisac (in Toulouse, 1786?), also on account of a knife in the stomach.

Much mystery surrounded the disease known as *goiter*. Formerly struma and scrofula were considered synonymous terms, and then also writers confounded goiter with scrofulous tumors of the neck. The physiologic import of the thyroid gland was unknown. According to Fodéré (1792), its principal function consisted in moistening the inner, ever dry surface of the larynx, due to the currents of air passing through it; hence it kept the windpipe moist by its own secretion. That author desired to have air and liquids injected into the gland through the air passages that communicated with the thyroid gland (Haller). Consequently the immediate cause of goiter remained doubtful. It was credited to melted snow water, the frequent enjoyment of chestnuts and similar foods (Gautier), and to water saturated with selenite; on the other hand Fodéré considered damp and warm air one of the main causes of goiter, and cretinism a disease closely allied to it. Others attributed its origin to carrying burdens on the head (Wichmann), while Richter, who discredited all these causes, believed it due mainly to the accumulation of mucous liquids in the thyroid gland and its neighboring tissues. Sometimes the swelling was restricted to a flap of the gland or also to the cellular tissue, while the gland itself retained its contracted condition (B. Bell). There was a kind of goiter known of which the distention was caused by air forcing its way in from the trachea, or resulted from the aneurysmatic enlargement of the arteries and veins (Gautier, 1794). Only with recently developed goiters and at the most up to the thirtieth year of life, could medicated treatment be successfully applied. It was considered essential that the patient retain the medicines in his mouth for some time before swallowing, so that they might be directly conveyed into the thyroid gland by the absorbents of the mouth. The principal remedy was burned amber; besides this calcined egg shells, soap, sulphurated potash, extracts of digitalis, sea water, change of locality, and various other remedies were used. External treatment consisted of a continuous rubbing of the tumors with dry cloths, fomentation of cold water, spiritus mindereri, volatile salve, camphor, etc. Sympathetic remedies (rubbing with the hand or the leg of a dead person) still flourished in the first half of the century; even the royalty of France and England were supposed to have power to heal goiter. An operative interference was reserved for large old goiters. If the swelling was soft it was punctured (J. L. Petit) or split, the pus squeezed out and then, in order to prevent further accumulation of the same, the cellular tissue between the gland and the skin was destroyed (Fodéré). Based upon their experience that occasionally large goiters heal spontaneously through the suppuration, Heister, and afterward Klein, successfully drew a seton through the swelling. Moreau advised the tying off the tumor. In case of aneurysmal goiter the carotid was tied above and below it. The use of ligature in goiter was suggested by Johann Muys in 1629, who said: "The veterinary surgeons cut off the artery which produces goiter and thus it is extirpated; and perhaps this method may be effectually used with mankind." Not until 200 years later was this ligature method attempted with goiter, at first unsuccessfully by Blizard, then by Ph. von Walther successfully in 1814. Regarding the complete extirpation of the same, the first attempts of the past century were not encouraging. Kaltschmidt in performing the operation, injured the carotid and his patient died before his eyes. Gooch tells us that a surgeon, who was generally very fearless, could not complete the operation on account of the violent bleeding, and consequently lost his patient after a week. In attempting a second extirpation the same surgeon could again not staunch the flow of blood, but saved his patient by applying a digital compress for a week. Then a few successful operations by A. F. Vogel (1771), Freitag (1778) and by Theden, became known; the subject of the one performed by the latter was nine inches wide, seven inches long and grown together with both carotids and the larynx. Desault was also successful in extirpating (1791) a small but firmly grown struma, and made it a rule to immediately tie the small vessels, for the present lay bare the art. thyroid., make punctures around it and then cut through it. In spite of the knowledge of successful attempts made, Heister would not hear of the operation, deeming it too difficult and the bleeding too extensive. He rejected it as soon as the swelling occupied the usual broad basis, when by means of the pressure of the goiter difficulty in breathing and deglutition and venous stagnation ensued, and then absolutely on cosmetic principles. Also B. Bell operated on only small swellings and contented himself by using the palliative method for the large ones, because the operation was too dangerous on account of the great flow of blood. The doubts expressed by the surgeons were exaggerated by the remarks of the physicians, as, for instance, Wichmann's: "The undertaking to extirpate goiter is just the same thing as if one undertook to cut off a patient's neck." J. L. Petit dared to remove a goiter weighing ten pounds; it was eight inches in width and intergrown with several of the large vessels; Forestier also (1791) suc-

cessfully removed several neck swellings, which seemed to be epidemic in Flanders.

In order to determine the extent of the penetration in *breast wounds* caused by a thrust the experiments with the vibrations of a flame, a feather, with an injection, and above all, with emphysema, were tried. If these did not disclose the true nature of the injury, the diagnosis was discontinued, as a penetrating wound without the immediate internal organs being impaired requires no other treatment than a non-penetrating one. A sounding of the breast wound was permitted only when the greatest care was exercised and this was done in the position in which the injury had been sustained; and a continuous probing to ascertain whether internal parts had been injured was decidedly rejected on account of its uselessness, the formation of new passages, and on account of inciting a new flow of blood. Desault, Richter and B. Bell raised serious objections and Foulmart opposed sounding in all cases. A penetrating wound without symptoms of internal injuries was bandaged quickly and simply with charpie. A plaster to prevent contact with the air seemed unnecessary, for, according to Richter, the air in the thoracic cavity, if capable of being exhaled and inhaled without difficulty, was not such an impediment in breathing as was generally imagined. If emphysema were employed at the same time, it would necessitate a distension of the wound. In treating wounds in the lungs it was especially important to avoid inflammation and suppuration or else to reduce them. These wounds Richter also bandaged quickly and superficially, rejected all kinds of plugging of the wounds, boldly bled his patients (Le Dran fifteen times, Schmucker for a whole week every six hours) and, up to the time of the prospective healing, prescribed cold compresses, cool air, the utmost quietness and, if connected with coughing spasms, opium and physics. Heister, on the other hand, warmed the atmosphere by live coals on a tripod before applying the bandage. The lung that had fallen forward was immediately pushed back; only mortified portions were cut off or tied off. When the blood entered the pleura, for which occurrence Heister did not give a single definite symptom, it was drained as speedily as possible, during his time, or the operation paracentesis was performed. But as considerable quantities of blood might be absorbed (Ravaton), the advice was given to aim at resorption rather than draining the blood, whereby the internal hemorrhage is increased (Sharp). When, however, it smelled foul, thoracentesis was the better operation to resort to, and that without delay, G. Van Swieten highly recommended it. If the wound was in the lower part of the breast, the patient was laid on the side in question and was allowed to breathe deeply, or the blood was sucked out. For this purpose there were different kinds of syringes with three-cornered, round, perforated projections, special sucking apparatuses, as it were (Ludwig); there were also elastic catheters (Theden), and various other instruments. In France, wounds after duels healed so marvelously that the sacrament was refused to those who recovered, as they were so evidently the "devil's own." If the blood had already coagulated so that the discharge was stopped, repeated injections of warm water or non-stimulating liquids (barley water) were made with the greatest possible care. For arresting the flow of blood from the arteria intercostalis, numerous new methods appeared. Special ligature needles (Gerard, Goulard, Heuermann) and a hook (B. Bell) were suggested, or the artery was compressed by means of dossils (Bilguer), cushions (Leber), or by a linen bag filled with charpie (Lassus); and sometimes the artery which had only been clipped was cut in two parts and then the ends were compressed (Theden), and various other methods were proposed.

The *opening* of the *thoracic cavity*, usually termed "the operation for empyema," which was so skilfully described by Hippocrates, was generally considered an easy, simple and safe operation, and was therefore warmly recommended (Heister, Morand, Lassus). Not only hemorrhages in breast wounds, also those after a fracture of the ribs and violent concussions of the lungs warranted the operation, as well as the collection of purulent matter. Yet there was no prospect of a complete cure, if the source of the suppuration was not found and drained. To make the operation dependent upon external intumescence, B. Bell rejected it and thought himself justified in so doing by the general symptoms observed. A third principal indication was hydrothorax. Great success in this operation of thoracentesis, which had so long been neglected, was observed by Morand, who was full of its praises. Unfortunately, the diagnosis was so uncertain that but few could make up their minds to use it. Fluctuation was considered as one of its surest symptoms. The patient as well as the surgeon felt it if they placed one hand on the ribs near the sternum and with the other struck the back; it could even be heard if the patient shook himself. Trecourt compared the sound to that of the water in a half-filled bottle when violently shaken. But also in doubtful cases the operation was permitted, if carefully performed. There was much wrangling over the place for the opening. At first the trocar was thrust into the thorax at the lowest spot between the second and third false ribs, about the breadth of the hand from the spine (Heister). This method was then done away with on account of possible injury to the diaphragm and the space between the sixth and seventh ribs, in a line with the shoulder, was pierced with a knife (Bromfield, Bell, Richter). Others did not confine themselves to a certain spot, but operated where it seemed most convenient (Warner), or first shifted the skin to prevent the air from entering (H. Bass). In order to avoid injury to the lungs and the intercostal artery, the intercostal muscles were gradually severed, the pleura having been bared before, and then the point of the knife was boldly thrust into the fluctuating spot. If the pus could be felt, the opening in the pleura was made rather small, as was always the case when only water was to be tapped. This was done very slowly, not all at once, and the wound was kept open by inserting a wick, a small silver tube (Heister) or a piece of tape (Richter). In empyema, injections of a decoction of cinchona were used (Hemmann). Whether the opening in the thoracic cavity ought to be done with the knife or the trocar, whether a tube should be inserted or not, were subjects of many disputes. Bell and Richter considered the tube superfluous in dropsy in the chest, and rejected the trocar because no one could know beforehand whether the lungs and the pleura had grown together. Heister, Morand and Camper, on the other hand, preferred the trocar, which, if thrust in obliquely, they believed, prevented the air from penetrating.

Abscesses in the lungs were fearlessly and successfully opened by B. Bell. If sure of the diagnosis, he

insisted upon the operation, no matter how deeply the abscess was situated in the lungs. He made an opening into the thoracic cavity, two to three inches in length, inserted his finger to find the abscess, and in two cases he had to thrust in his lancet into the substance of the lung to the depth of a finger before the pus came. Nearly half a pint of matter was drained and the patients saved. Richter believed that, unfortunately, the diagnosis, which is based on the seat of the pain and on the fluctuation, was safe enough to allow the opening of the abscess in rare cases only and that a prospective cure did not exist unless the abscess had formed accidentally and the strength of the patient was in good condition. And yet he approved of the operation even if the abscess in the lung had already burst open in the bronchi and the patient emitted pus and showed signs of consumption, an operative interference might be ventured upon in case the symptoms were less plain, as the abscess is often more correctly located during the operation. There was no doubt in Richter's mind that it occasionally averted tuberculosis. He already presented ideas of a *mechanical treatment of phthisis pulmonaris* which at the present time, is again being variously ventilated. He proceeded from the idea (de phthisi pulmonali operatione chirurgica sananda) that the difficulty in healing abscesses in the lungs was largely due to the continuous admission of the atmospheric air and the tedious discharge of the pus. Since in the usual horizontal position of the patient the matter did not readily drain and the abscess was always filled with the same, the general rule for abscesses should be followed in connection with the lungs; for instance, if there is difficulty in discharging the pus, a counter opening ought to made. Therefore, besides the horizontal position, he advised emetics, inhalations, artificial issues, but principally a counter opening. Of course a recovery could only be expected if the phthisis pulmonaris was due to a local cause in a usually sound body. The difficulty was with the diagnosis regarding the seat of the abscess; and it seemed to him that the symptoms of an open abscess not alone indicated an operation but also those of a vomica. He is thought to have achieved good results with counter openings as shown by the following extract: "Of all consumptives the entire chest should be frequently examined and if the surgeon note anything to justify him in making an opening, he should do so without hesitation. This by no means increases the violence in the disease; but it might occasionally effect a cure if the patient has not become exasperated and the phthisis pulmonaris is the result of a benign local cause." Suppurations and extravasations into the anterior mediastinum required a trephining of the sternum, which then, in caries of the breast-bone, but not in reduced fractures, was warmly recommended by French and German surgeons. J. L. Petit had often trephined the sternum, in one case even three times, and cut out the costal cartilages. Larger pieces of carious ribs had been successfully cut off at the same time (Gooch, Acrel). A collection of air in the thoracic cavity indicated an opening of the same, but only if there was a simultaneous fracture of the ribs, seldom in penetrating breast wounds. The operation was also recommended by Bourdelin in extravasations of the chyle after wounds in the thoracic duct; but the observations thereto are missing.

The *paracentesis of the pericardium*, first proposed by Riolan (1653), was at times considered life, saving, at any rate harmless (Bell, Richter) in dropsy, the diagnosis of which was based upon fluctuation between the third and fifth ribs with every beat of the heart. A puncture was made between the fourth and fifth ribs with a small trocar (Senac) and the water allowed to flow off only after short intervals. Once Desault, Dubois and Sue could not agree whether heart failure gave rise to dropsy of the pleura or of the pericardium. Desault, for this purpose, opened the thoracic cavity between the sixth and seventh ribs opposite the apex of the heart, felt a fluctuating sac, which he incised and then he felt the heart like a conical body beating against his finger. The section proved the error, that the sac was not the pericardium, but it lay between it and the lungs and the heart stuck fast to the pericardium, which was filled with blood in various places. Successful attempts at paracentesis were not known in the preceding century.

For *paracentesis of the abdomen* in ascites such great enthusiasm was manifested that medicated treatment was pushed into the background. It was deemed most important to perform the operation as early as possible. Richter saw more harm done by medicaments than good and thought the operation an easy, quick and surely successful, painless and safe method. He was displeased that so often it was deferred until all sorts of urinary remedies and purgatives undermined the constitution and the abdomen was badly swollen. An operation should always be performed as soon as a fluctuation can be felt (Le Blanc, B. Bell). Even if regarded as a mitigating remedy, the puncture possessed many more virtues than the medicines; and, at times, effected a radical cure, when the serum had again accumulated, if not made too late, but is often and in close succession repeated. Desault punctured thirty-two times and that within a week, until no more relapses ensued; Mead and Schmucker made from fifty to seventy perforations and thereby preserved the patient's life for several years. According to A. Monro, the puncture was made in the spot where the fluctuation could be plainly discerned, to the left in the middle of a line drawn from the umbilicus to the spina ant. sup. The place of perforation, however, was variously chosen. The navel (Petit, Chopart, Desault), linea alba (Sharp), the lateral region of the abdominal cavity (Heister, Bell, Richter), the vagina (first recommended by Henckel, Watson), the rectum (Allan, Sabatier), the scrotum with simultaneous congenital hydrocele (Le Dran). The common trocar retained the preference given to it and instruments which were modifications of it (flat, double-edged point according to Bell), as well as the suggestions to first puncture with the lancet and to insert into this a trocar with a dull point (Cline), or to employ the lancet alone. All alleged improvements of the trocar Richter considered poor, also the injections (diluted red wine according to Hale's, lime water according to Martin's idea) recommended to be used after the puncture in order to prevent the serum from again collecting, these good physicians disregarded. The fear of a rapid and total evacuation of the fluid was looked upon as unfounded, if from the beginning of the operation the abdomen was uniformly compressed and afterward a pressure by means of a bandage or napkin was brought to bear upon it (Cheselden, Mead, Fothergill). There to Monro invented a particular kind of "compression belt." Hunter and

Cline had the misfortune to injure the arteria epigastrica. Operative interference by puncture was also recommended in tympanites of the abdomen (Combalusier 1747, B. Bell).

Whenever in a penetrating *abdominal wound*, the finger could be inserted, sounding was not resorted to. The wound was immediately closed up by plaster strips, or the suture, so as to avoid any contact with the air, and the patient was freely bled. A piece of sound intestine that had fallen forward was at once put back and the wound was distended if necessary. For this purpose many useless, complicated instruments had been invented (le Dran, Morand, Petit). In establishing the abdominal suture, as much of the peritoneum was caught as of the skin and muscles; the thread was begun an inch from the margin and the lower corner of the wound was left open; B. Bell, however, sewed up the whole wound. In case of extravasations in the abdominal cavity, which were mostly found in clots and never spread over the entire cavity, a portion of the wound was allowed to remain unstitched and cold applications were made to distribute the blood. But if, besides the irritating conditions, there was a fluctuation felt and there was discharge of urine, bile and excrement, a puncture with the trocar was required as soon as possible. Three different methods were pursued in the treatment of intestinal wounds, the portion that had fallen forward was stitched, an artificial anus was formed, or everything was left to nature. She could not directly close the wound, but effect an adhesion of the surrounding parts, thus covering up the wound. In stitching the intestinal suture, the wounded part had to be fastened with a thread close behind the abdominal wound, so that the contents were discharged toward the outside and not toward the inside. The sutura ansata with one thread (several according to B. Bell) was preferred to the Kürschner suture and to the many other new inventions. The method of Ramdohr, a surgeon in the mountains of Zellerfeld, who inserted the upper end of the intestine into the lower and by means of the suture secured it close to the abdominal wound (made known by Möbius in 1730) was greatly favored. Antiphlogistics and daily enemas were prescribed for a few days until the removal of the stitches. Nature, it is true, worked amazingly in many cases, although occasionally an anus præternaturalis, always a contraction, remained.

(To be continued.)

SOCIETY PROCEEDINGS.

The Berlin Lepra Congress.

General Report of the Berlin Lepra Conference.

OBSERVATIONS ON CONTAGIOUSNESS OF LEPROSY.

Prof. K. Dehio of Dorpat said: Hansen and Looft already contend that the maculo-anesthetic form of leprosy is less dangerous as to contagiousness than the tuberous form, and my own experience in Livonia compels me to agree with them. My disciple Lohk has quoted in the parishes of Kielkond and Ansküle, on the island of Oesel (c. f. r. Compare Lohk, epidemiologic researches on leprosy and the etiologic relations of its forms, *Arch. of Dermat. and Syph.*, 1897), forty-eight cases of lepra tuberosa, eleven cases of lepra anesthetica and two cases of lepra mixta. Among the forty-eight tuberous cases there are thirty-six, that is, 75 per cent., which in all probability have caused further disease and consequently had contagious effects. Among the thirteen cases of lepra anesthetica and lepra mixta, on the other hand, there is not a single one which allows even the suspicion that it has caused further disease. This fact is the more important as Lohk, at the time of his researches, was quite unaware of the innocence of lepra anesthetica, and believed it to be as dangerous as lepra tuberosa. There can therefore be no question of a positive presentation of facts. The popular opinion which develops and establishes itself in the course of the centuries, and which in regard to the causes of disease, so often hits the mark, is also on my side. In Oesel at least, where leprosy belongs to the diseases well known to the people, the peasant considers lepra anesthetica as not being contagious at all. While the tuberous leprous patient is shunned by the whole world, the anesthetic leper is feared little or not at all. There are many even among the common people who believe that lepra maculo-anesthetica is a disease *sui generis* and has nothing in common with the tubercular leprosy. I personally know only three or four cases where leprosy is possibly, or at least might be, attributed to the intercourse with anesthetic lepers, while I know by the dozens, evident contamination through tuberous lepers.

My opinion therefore is: Lepra tuberosa is a contagious disease; but lepra maculo-anesthetica, though caused by the lepra bacillus and the lepra virus, is in itself contagious only in a small measure or only temporarily.

The massed appearance of the lepra bacillus in tubercular leprosy and, on the other hand, the difficulty in finding the bacilli in the maculous and anesthetic form, is perfectly in accord with my opinion.

If I am right, this might be of great practical importance. As we do not so far possess any cure for leprosy, the only possibility for combating it lies in strict isolation within the leproseries, so that the diseased may be prevented to transmit the evil to other men. But if lepra anesthetica is not contagious, or very little, we may perhaps show some mildness in the treatment of the latter.

By this means the combat against leprosy would become much cheaper, but would also for many of these people lose its terror and assume a more humane appearance.

Dr. Hellat of St. Petersburg said: In the question of optional or obligatory isolation, the social conditions and popular ideas of every country must be considered. To shoot sparrows with heavy ordnance is not practicable. If in a country the people are enlightened enough to understand the danger of free intercourse with lepers, or if it goes so far as to be convinced of it, then optional isolation might expect sure, perhaps even full success. But if, as happens with us, the written word does not exist for the people (they do not read the newspapers), where fraternization and genuine communism are in so high degree at home, and where at the same time religious habits overrule every other inclination (on Easter morning everybody in Russia kisses the other on the lips, *even the Emperor*, with the words, *Christos Voskies*, Christ is risen), optional isolation would be only a half measure and perhaps a totally futile one. Here only compulsory isolation can be relied upon.

First International Congress of Neurology, Psychiatry, Medical Electricity and Hypnology.

This congress met at Brussels in September with a large attendance including many names well known in this connection. The increasing importance of cerebral surgery as the physiology of the cortex becomes better known was emphasized; also the satisfactory results obtained by surgical intervention in epilepsy when the lesion is clearly defined and can be completely removed. Numerous communications were presented on the subject of electrotherapeutics, and the necessity mentioned of the establishment of standards for the reaction, and the characteristics of excitation. Professor d'Arsonval's "high frequency" current was recommended by several, and its beneficial effect in obesity, etc., reported, but Regnier denied its superiority to franklinization in diabetes and neurasthenia (*Vide* Journal page 762). The question of criminal suggestion elicited contradictory discussion, as the Nancy school believe that the hypnotic subject is irresponsible and can be made to commit any crime by suggestion, while Milne-Bramwell denies this and states that the conscience or sense of propriety is still alert and will prevent the execution of any act in the hypnotic state, which the subject would not commit in his normal condition. Liegeois (Nancy) asserted that in every person in a condition of induced somnambulism, an actual automatism can be produced by verbal suggestion, even to the extent of committing murder or other crimes, while perfectly unconscious. A woman or girl can be violated without knowing it. The author of the suggestion is the only criminal and the only one to be punished. He adds that there is a remedy for this state of affairs: Every man, woman and child should

be tested by some reliable, competent person to discover his or her degree of susceptibility to hypnotic influence. If profound somnambulism can be induced, then the suggestion must be impressed that he or she can not be hypnotized by any one nor by any means in future. The subject is thus morally vaccinated, as it were. Milne-Bramwell does not consider the crimes suggested in the laboratory any test as to the actual commission of crimes outside, as he believes the subjects have always a realizing sense of the pretended character of the acts and advises questioning them more frequently. In regard to the therapeutic value of hypnotism and suggestion, he asserted that it varies with the duration and gravity of the disease and the mental instability of the subject. He reported good results in moral insanity, alcoholism, morphinomania, cocainism, hysteria, hiccough, hysteric trembling, neurasthenia, insomnia, migraine, chorea, obsessions, incontinence of urine, facial neuralgia, amenorrhea, dysmenorrhea, menorrhagia, deafness, seasickness, acute and chronic rheumatism, constipation, hyperhidrosis and eczema. He traced the history of hypnotism, showing the influence of Braid in its evolution and called attention to his thirty-six works, which should not be overlooked by the student of this science. He also endorsed Delbœuf's theory in regard to the secondary or subliminal conscience in hypnosis, which is able to modify the organs and functions not under the control of the will, and is analogous to that of the lower animals. In spite of the insufficiency of this explanation, the conception of hypnosis which it implies is more correct than the assumption of the automatism of the subject. He added that the death of Professor Delbœuf is deplored by all the workers in the field of hypnotism. Few since Braid have had such a clear conception of the mental and moral condition of the subject, or have done so much to unmask the deceptive appearances of laboratory crimes and experiences. His explanation of the possible origin of the curative effects of hypnotism, in organic lesions, constitutes a scientific and original advance full of promise for future research. We add a summary of Bernheim's views presented at the Moscow Congress, for comparison, as he is one of the leaders of the Nancy school:

Suggestibility is a physiologic property of the human brain; the tendency of the brain to realize all the ideas accepted by it. Every idea accepted is a suggestion. Hypnotism is not a special state; it is the setting into activity of suggestibility, with or without sleep. Suggestion can make some persons commit crimes, either by instinctive impulsion, by hallucination or by perversion of their moral sense. Suggestion can not destroy a robust moral sense nor create it when it is absent; it develops existing germs of good or evil. Suggestion, that is, the idea wherever it may come from, plays a part in almost all crimes. Congenital weakness of the moral sense, and great suggestibility facilitate criminal suggestion. A wrong or criminal deed may be committed in a somnambulistic condition of hetero- or auto-suggestive origin. False testimony may be presented in good faith from fictitious souvenirs evolved by auto-suggestion. There is no such thing as absolutely free will. It is impossible to appreciate the moral responsibility in most cases. Society has only the right of defense and prophylaxis. Education should intervene and neutralize vicious germs and oppose coercive suggestions to natural impulses. A new psychotherapeutic treatment was described by Aimé of Nancy, which consists in strengthening the therapeutic idea by representing it in action to the patient. The idea, incarnated by voice, gesture and action, stimulates the psychic cells and through them the nerve elements, and the contagion of example and limitation starts the therapeutic action and enables the patient to throw off the opposing ideas accumulated in his brain. This psychic dynamogenics has been found especially valuable in neurasthenia of the aboulomania type, in psychopathy with deficient ideation, and in ideomotor dynamic troubles of traumatic or emotive origin, many of which resist hypnotic suggestion and all other treatment.

The broad scale on which the Congress was planned has been much commended. Among the other speakers were Eulenburg of Berlin, on "Exophthalmic Goiter," which he considers still belongs to the domain of internal medicines, and is caused by a qualitative and toxic alteration of the fluid secreted by the glands; Mendelssohn, St. Petersburg, "Pathogenesis of Reflexes"; Van Gehuchten, "Muscular Rigidity in Nervous Affections," and Sancte de Sanctis, Rome, "Psychoses and Dreams." Professor Thomsen of Bonn, called attention to the long duration of the incipient stages of general paralysis and the value of the prodromal symptoms for its early recognition and differentiation from cerebral syphilis and neurasthenia (Argyll-Robinson's and Westphal's signs, fleeting ophthalmoplegia, disturbances in articulation, atrophy of the optic nerve, paralytic or aphasic attacks, etc.). The next Congress will be held at Paris in 1900.

American Public Health Association.

Twenty-fifth Annual Session Held in Philadelphia, Oct. 26-29, 1897, at the Hotel Walton.

(Continued from page 1169.)

FROM SEWAGE TO DRINKING WATER—A STUDY OF THE NATURAL PROCESSES OF SEWAGE PURIFICATION AND OF THE MEANS WHEREBY THEIR EFFICIENCY CAN BE INCREASED,

by Col. GEO. E. WARING, Jr., M. Inst., Commissioner of the Department of Street Cleaning of the City of New York.

He said: Where circumstances permit the discharge of sewage into the sea or the strong current of a great river not used as a source of domestic supply, is usually the simplest and least expensive method of disposal. The great majority of inland towns remote from streams, are confronted with a problem daily growing more urgent and complex. General introduction of water-supplies, then the overlavish use of that water, have made necessary a sewerage system to remove the foul floods. By furnishing the proper conditions the sewage of the largest city can be freed from impurities and the water can be passed on as pure as when first received. This is the exposure of the sewage to the reducing action of bacteria for a certain time. Our chief efforts must be directed to the furnishing of oxygen to each particle of sewage at all stages of the operation. If oxygen be absent or insufficient, disintegration begins by the germs of putrefaction, which break up the organic structure, but which allow the nascent elements to recombine in offensive compounds. The disgusting changes in sewage stored are the result of putrefaction consequent upon imperfect aeration. We secure the aeration by spreading the sewage in a thin layer upon a tract of land so that every drop is exposed. The land must be well drained to allow the escape of water and the liquid must be applied intermittently. Usually the period of rest and aeration must be twice as long as the period of use. One acre of ground will purify the waste of 500 to 1,500 people. When sufficient land can not be had, recourse is made to intermittent downward filtration. Its principal essential is a porous soil. The work is carried on both above and below the surface. Thus we can pass the liquid at a higher rate of speed. One acre of well-constructed filtration-beds will care for the sewage of 1,500 to 5,000 people. The writer in 1894 tested the theory at Newport, R. I., as to forcing air through the filters. Tanks filled with broken stone and gravel aerated by an air-blast from a blower at the bottom was built. Sewage containing the normal impurities of fresh domestic wastes, and the putrid overflow of old cesspools escaped within four hours of its entrance, odorless, tasteless, colorless and sparkling. Chemic analysis showed it better even than the city supply. The impurities which had been removed were not stored in tanks, for they too remained sweet and clean, without any change of filtering material during the whole five months of the experiment, and when taken apart showed no sign of organic material; the gravel was as clean as the day the filter was built. All the filth had been consumed and resolved into atmospheric nitrogen, water, carbonic acid and nitrates. The limit of capacity was never reached. A rate of application was attained showing that one acre of artificially aerated filters would purify the sewage of over 50,000 people. This plant was removed and set up to treat the waters of the West River much polluted by waste from a large woolen mill; it worked admirably. Last February he took charge of Willow Grove Park, Philadelphia. Soon after its opening as a pleasure ground it was found necessary to arrange for the disposal of the sewage. Lavatories and toilet-rooms were scattered over the grounds, a large restaurant added to the waste, dairies and ice cream pavilions added their waste, with the sewage from the car barn, etc. The liquid is stronger than the average of town sewage; total 80,000 to 100,000 gallons daily. The only water course near was a small stream feeding a lake and a lilly pond. Its maximum dry weather flow was through a five inch pipe; at times its bed is dry. Thence it enters another pleasure park forming a pond for boating and fishing. The only land available was a mile away, higher than the park, involving the laying of a long force main and constant heavy pumping. The soil is stiff heavy clay, not well suited for irrigation, and absolutely unfit for downward filtration. The latter process would have involved the construction of an acre of filter-beds with material from a distance. Filtration with forced aeration was adopted, requiring one-eighth of this area. It was impossible to deliver the sewage by gravity. The flow is collected in a receiving well of 12,000 gallons. The essential feature of this well is a series of screens to withhold rags, paper, corks, etc. Two screens are used, the outer coarser, of five-eighths inch vertical iron rods with half inch openings between them, permanently fixed across the entrance to a masonry chamber surrounding the suction-

pipe through which the well is emptied. The second screen is a frame of galvanized flat iron, diagonally braced and covered with iron netting of one-quarter inch. This slides into channel iron grooves built in the masonry a few inches behind the first screen. A second pair of grooves is provided close to the first so that another fine screen can be lowered whenever one needs removing. One of these will pass sewage without clogging, for six or eight weeks. From this well the sewage is pumped to a distributing tank and led by gravity to the filters. The valve is adjusted so that under normal conditions the sewage will accumulate in the tank during the day to escape at night when the sewage is slight. Thus a more or less constant flow is maintained. The process of purification comprises the mechanical removal of suspended solids by deposition and their subsequent destruction by bacterial action; then the dissolved impurities remaining in the clarified liquid are attacked and purification is complete. The first operation is performed by filters which we call strainers; shallow rectangular tanks with concrete floors covering each an area of 675 square feet. Floors are covered with a system of channels made up of hollow Raritan tile laid loosely with open joints which collect water and distribute air. An opening in each tank at the floor level controlled by a valve communicates with a chamber which is constantly full of air under light pressure applied by a blower. While a filter is in operation, this opening is closed by shutting a valve. Each strainer is divided into two compartments built not from the floor of the tank but upon the tile so that liquid and air can pass freely from one to the other. The false flooring is covered with a thin layer of large broken stone to protect the joints against the entrance of finer material and each compartment is filled to 30 inches with broken stone of one-half to one inch in diameter. The sewage enters the upper compartment, passes through the filtering material under the diaphragm wall, and rises in the lower compartment, overflowing into a collecting channel. The movement is slow so that all suspended matters are deposited upon the filter within three inches of the surface of the stone of the compartment. The action is purely mechanical. Gradually the deposits interfere with the freedom of the flow and the sewage begins to back up in the receiving compartment, the increased head counterbalancing the increased resistance. This condition is accompanied by no deterioration of the quality of the effluent. The clarification is usually a little better at this stage than when the filter is clean, for the accumulation of sludge on the surface of the receiving compartment acts as a finer filter, and prevents the passage of even the most minute particles. The resistance becomes so great that the sewage threatens to overflow the walls of the receiving compartment. The flow is then turned into another strainer and the decomposition begins anew. Now the valve in the bottom of the strainer is opened, the liquid contents drain away, passing back to the receiving well for further treatment. The amount returned to this well is considerable, for the filters are drained but seldom and the quantity at each is small. As soon as the liquid of the tank has escaped, air from the blowers enters the unsealed opening, rushes through the distributing channels which cover the floor and, escaping through the joints, rises in the filtering material, supplying to every part of the mass the oxygen needed for bacterial activity. Oxidation begins immediately. Each particle of filth is attacked by the reducing organisms, consumed and resolved into gases or soluble mineral compounds. As the supply of oxygen is abundant and constant, the bacteria multiply, and long before the next period of use the entire accumulation of filth disappears, leaving the filter clean and able to pass sewage as freely as when new. This alternate choking and cleansing proceeds indefinitely. With proper care, especially in the exclusion of silt, the work will be uniformly good and no renewal of the filter be needed. There are three of these strainers, any two in alternation are sufficient. As the sewage leaves the strainers, it is free from suspended matters, has a slight opalescent cloudiness and a perceptible odor of urine. It still contains all the dissolved impurities of the sewage. These are removed by passing it through a second filter called the aerator. Here, filtration and aeration are carried on constantly and simultaneously and the whole area is normally in constant use. The floor of the aerator is covered with a series of channels to collect and remove the purified water and distribute the air from the blower. These channels are covered with a thin layer of coarse broken stone which supports the next and main layer of three feet of crushed coke, from which all dust has been removed. Over the coke is placed a six inch layer of coarse broken stone packed with finer stone at the top, the whole covered with six inches of coarse sand lightly compacted with a broad wooden rammer. This retards and distributes the flow. The liquid passes slowly, trickles down in thin films over the particles of filtering material, escaping through a trapped outlet at the bottom. It is in constant contact with a current of air from blower, rising through the valves, passing through the vent tiles which perforate the blanket of sand in each of the four divisions of the aerator area. The time required for the percolation is one hour. The bacteria are stimulated to their maximum activity by the abundant supply of air and are ransacking each drop for food. Before the water reaches the bottom, the dissolved organic impurities are destroyed and the only trace of its recent foulness is a high percentage of nitrates. The regeneration is complete. At the Park named, the supply of water is abundant, the purified sewage is collected as it leaves the aerators and drained to an effluent soil, connected by a pipe with one of the smaller lakes. Here the water is stored for use and pumped to an elevated tank, thence piped to sprinkle roads, flush closets, urinals, etc. It is clean and wholesome and, save for sentimental reasons, might be used in the lavatories, the restaurant and the drinking fountains. In all processes of bacterial oxidation, the maximum of efficiency is reached only after a certain period of use. The organisms must be given time to multiply and spread. The daily attendance at this grove varies from 100 to 30,000 daily. A similar but smaller plant has been constructed at Homewood, South Brooklyn, L. I., for the City and Suburban Homes Co. of New York to purify the sewage of one hundred houses and which for years will have no other outlet. The process of bacterial oxidation in these filters is identical in theory with that of irrigation. Only in the former, artificial aeration supplies to the entire mass the conditions which in irrigation are confined to the surface alone. In other words, the introduction of air under pressure makes it possible to concentrate in cubical form, in a single tank, the effective area of a whole acre of irrigation field.

The operation of the system is simple and any intelligent laborer can easily learn to control it. It consists mainly in judicious distribution of sewage and air and the occasional raking over of the filter bed. One man can care for a large plant. Where sewage can flow to the filters by gravity, the wages of the attendant and the cost of running the fan are the only expenses. The filters once built and filled are practically indestructible.

"Investigation of Water Supply by the U. S. Geographical Survey," was presented by F. H. NEWELL, hydrographer, U. S. G. S., Washington, D. C. He outlined the work of the U. S. Geographical Survey in making a thorough examination of the geologic structure, mineral resources and products of the national domain. . . . The Division of Hydrography was created in 1888. From that date the work has gradually extended and now embraces practically three classes of work. The first consists of the measurement of streams in various parts of the country and the determination of surface supplies in lakes and rivers. This necessitates operations carried on through several years and at widely separate points. It includes the examination of reservoir sites, especially upon the public lands and the feasibility of using these for increasing the water supply. . . . The second class of investigations is purely geologic. It consists in examination of underground waters and artesian well conditions. Operations are mostly confined to the western half of the United States, where the deep-seated sources of supply of pure water have the greatest value. The third class consists in preparing reports upon the best methods of utilizing the water resources and these include a wide variety of subjects, as storage, pumping, irrigation, filtration, etc.

The papers on "Tuberculosis" were thoroughly discussed. Dr. L. F. FLICK of Philadelphia said: To stamp out the disease we must remove people from the presence of the contagion. Hospitals for consumptives are imperatively demanded. This would soon reduce the death rate, as we see everywhere when people are removed from the constant exposure to the emanations of those afflicted. He believed that often there was in butter and milk a microscopic organism resembling the bacillus tuberculosis but not identical with it, and which many examiners took for that bacillus.

Miss LYDIA RABINOWITSCH of the Woman's Medical College detailed experiments made by her with butter and milk. In milk she found from 20 to 30 per cent. of these bacilli. In eighteen samples of butter she had not found one bacillus, but had found a micro organism which resembled it.

Dr. H. M. BRACKEN, secretary of the State Board of Health of Minnesota, read a paper on

TYPHOID INFECTION.

Over 1,800 examinations of blood after the Widal-Johnston method have been made at the laboratory of the Minnesota Board of Health during the past ten months, and while the serum diag-

nosis quite uniformly has been borne out by the clinical diagnosis there have been cases where the blood gave marked reaction with the first of typhoid fever symptoms, but where the clinical symptoms quickly disappeared and there was a prompt return to health. There have been cases where the serum reaction has persisted for a time after recovery and such cases are stumbling blocks to the physician. How can we explain these facts? May I suggest the possibility of typhoid infection without the classical typhoid fever? Certain individuals have a natural immunity to the disease. Others have acquired it, the result of disease in the past. Still others become immune in a manner quite similar to that by which we produce artificial immunity, namely, by constant exposure to an infection, too small in quantity, however, to produce the specific disease. Those individuals who are constantly using water with the germs of typhoid fever may escape, while the newcomer soon succumbs. Still further, we know individuals constantly using contaminated water may at one time be able to resist infection, and at a later period become infected though using the contaminated water in the same quantity and manner in both cases. In the light of the foregoing facts may it not be possible for an individual to receive such a degree of infection as will produce the early symptoms of the disease and for the system to develop an antitoxin so promptly and in such an amount as to cut short the procession of the disease? Thus to prevent the completion of the classic typhoid fever, it would seem that an unusually marked reaction to the serum test with the early appearance of such symptoms and the prompt subsidence of all followed by health would bear out such a proposition. It would seem, with an early and marked Widal reaction, as though the conditions of the blood producing such reaction might have some bearing on the degree of resistance of an individual to infection and this would suggest the possibility of the reaction being one of immunity rather than of infection. This I know is contrary to the teachings of Widal and others, but it is safe to say that the consensus of opinion is yet unsettled as to the relations of serum reaction to immunity. . . . The serum reaction as a rule appears earlier with younger than with older cases; half of the second and third positives being among children, though they numbered only one-seventh of the total positive reactions. . . . If it is true that serum reaction obtains earlier with children, that reaction is marked and the mortality is lower it would seem as though this had some bearing on making the reaction as one of immunity rather than of infection. Quite a number of cases of adults on record show marked serum reaction early and was followed by a rapid subsidence of the typhoid symptoms.

"Hydrants; Closed Fountains," was presented by Dr. EMILIO ZERTUCHE, delegate from the State of Pueblo, Mexico. He exhibited a hydrant which he believed was the proper form to use, closing off the water completely.

(To be continued.)

PRAGTIGAL NOTES.

The Neglect of Revaccination.—Jasiewicz (*Jour. de Clin. et de Thérap. Infant.*) recommends more frequent revaccinations and cites the case of twenty-three children under 6 years of age where the successes were seven in number, or 35 per cent. He believes that it protects from other infectious diseases as well as variola.

Placenta Previa Centralis.—A typical case is described by Von Weiss in the *Cbl. f. Gyn.*, No. 22, in which the placenta was attached to a large proportion of the cervical wall, the cervix mucosa forming a part of the decidua serotina. After extraction of a dead child delivery of the placenta was extremely difficult, owing to adhesions. Death followed four days later from sepsis.—*Wien. Klin. Woch.*, July 29.

Auto-intoxication as a Predisposing Cause of Infection.—Poehl (*Wien. Med. Woch.*) gives as the main causes of auto-intoxication: Diminished alkalinity of the blood due to acidity of the tissues from overexertion or other causes; insufficient supply of oxygen; abnormal fermentation processes in the intestine; poisoning from without by bacterial or other agencies; retention of metabolic processes. Many of these conditions, he says, can be detected by an examination of the urine, and in support of his views relies upon elementary proportions. He holds that the resisting power of the organism depends very largely upon the manner in which its internal or tissue respiration is carried on and avers that he has never examined a case of infectious disease in which this has been normal.

Mycosis of the Pharynx.—Castex removes with Duplay's forceps the small tenacious white patches as they develop, after the patient has gargled with a hot 1 per cent. aqueous solution of resorcin. Ten sittings will complete the cure in obstinate cases. The most diverse micro-organisms were found in some cases, and none in others. The etiology is very obscure. It seems to affect debilitated persons with previous throat inflammations, most frequently women between 15 and 30 years of age.—*Journ. de Méd. et de Chir.*, 68th year, No. 20.

Early Symptoms of Puerperal Infection.—Slight elevations of the temperature (37 to 38.2 degrees, axilla), usually once a day, sometimes more frequently, separated by intervals of lower temperature; the pulse more rapid, even when the temperature is not elevated, 80 and above. The sleep at night is also an important indication, as good sleep denotes a more favorable prognosis, while insomnia in connection with higher temperature and more rapid pulse, with a sensation of chilliness in the back, trunk or limbs, and a change in the lochia, as decrease, suppression, fetidity, indicate approaching infection.—*Gazz. d. Osp. e d. Clin.* of October 21.

The Danger Point in Anesthesia.—As anesthesia progresses, the corneal reflex is abolished and the pupil contracts to a point. The moment the pupil reaches this point, the anesthesia is profound and the chloroform should be suspended. If the pupil begins to dilate again slowly and gradually, more chloroform will reduce it again to a point. But if it suddenly dilates rapidly, this is a signal of impending immediate collapse, and every effort should be made to facilitate respiration. Gradual dilation of the pupil from the punctiform state is the natural arousing from the anesthesia, but brusque, rapid dilation to its maximum is the danger signal.—*Journ. de Méd. et de Chir.*, October 25.

Ichthyol-glycerin Tampons in Chronic Vaginal Gonorrhea.—Certainty and cure can be attained in the puzzling cases in which the absence of the gonococci and the persistence of the trouble lead us to doubt our diagnosis, by tamponing the upper portion of the vagina with 10 per cent. ichthyol-glycerin, preferably just before or after a menstrual period. The mechanical irritation of the tampon, the softening effect of the glycerin and the influence of the ichthyol, cause such an increased secretion that the cocci are dislodged in the depths and brought to the surface and the epithelium peeled off. A dry tampon is inserted, with iodoform later, and the vagina is then ready for the argentum nitricum. Bodenstein explains the advantages of this tamponing in the *Deut. Med. Woch.* of October 14, as he has used it in fifty cases with the best results and no inconveniences. He recommends, in the preliminary irrigation, to allow air to pass through the tube before the liquid begins to flow, which will distend the vagina and smooth out the folds.

The Morphin Habit as a Legal Defense.—A kleptomaniac in one of the British courts plead guilty and her counsel assured the bench that she was in no want of money, but had sufficient means to enable her to live comfortably, and asked that she be treated leniently on the ground that the theft was due to the effects of the excessive use of morphin. According to the testimony, she had consumed ninety-six grains of morphin in a single week. The magistrate suspended judgment, upon the defendant giving security in £50 to appear for sentence when required. De Quincey's daily consumption of laudanum was nine ounces and there is a case on record where 120 grains of opium were taken at once without producing death. The tolerance of opium and its salts proves in reality much more than old women's fables, and instances of enormous doses are in the possession of nearly every family practitioner. A poisonous draught of laudanum can not be measured by cases on record.

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SATURDAY, DECEMBER 11, 1897.

THE PRESIDENT'S MESSAGE.

The President in his message gives the following statement based upon report of the Secretary of the Treasury:

The recent prevalence of yellow fever in a number of cities and towns throughout the South has resulted in much disturbance of commerce and demonstrated the necessity of such amendments to our quarantine laws as will make the regulations of the National quarantine authorities paramount. The Secretary of the Treasury in the portion of his report relating to the operation of the Marine-Hospital Service calls attention to the defects in the present quarantine laws and recommends amendments thereto which will give the Treasury Department the requisite authority to prevent the invasion of epidemic diseases from foreign countries, and in times of emergency like that of the past summer will add to the efficiency of the sanitary measures for the protection of the people and at the same time prevent unnecessary restriction of commerce. I concur in his recommendation.

In further effort to prevent the invasion of the United States by yellow fever the importance of the discovery of the exact cause of the disease, which up to the present time has been undetermined, is obvious, and to this end a systematic bacteriologic investigation should be made. I therefore recommend that Congress authorize the appointment of a commission by the President to consist of four expert bacteriologists, one to be selected from the medical officers of the Marine-Hospital Service, one to be appointed from civil life, one to be detailed from the medical officers of the army, and one from the medical officers of the navy.

In the natural order of things under the present system, the bureau is the custodian of all papers and documents relating to any matter under consideration.

There seems to be no question but that something is necessary to perfect the health service, whether it should take the shape of increasing the powers of the Treasury Department, or whether to create an independent bureau, utilizing the existing machinery and having at the head of the new department a professional man, is for Congress to determine. Theoretically the chief of the Marine-Hospital Bureau is supervised by the Secretary of the Treasury; practically he is under no supervision at all, as the Secretary of the Treasury does not know the technique of the question at issue. There is nothing in the message incompatible with the recommendation of the AMERICAN MEDICAL ASSOCIATION, and even if there were incompatibilities it is Congress that enacts the laws. The report of the Secretary of the Treasury shows the number of sailors treated during the year, the cost of conducting this branch of the department, and gives the total number of deaths by the yellow fever epidemic.

The placing of this excellent service in a new Department of Health whereby orders would be received from a medical man acting in part for a council representing the whole country, would be of infinite benefit and would insure the necessary co-operation in case of epidemic. The AMERICAN MEDICAL ASSOCIATION Bill provides for semi-annual consultation with the State Boards of Health, thus making thorough harmony and co-operation between the Government and State. As it is, it is not at all likely that this or any other Congress would pass a bill increasing the powers of the Government in the matters of inter-State quarantine.

It will be noticed that the recommendation of the President refers simply to increasing *quarantine* powers; not a word is said on the subject of co-operation with State boards or of adding to the hygienic functions of the Health Department. As a matter of fact, quarantine is the smallest part of the business.

The recommendation for a commission of experts to visit Cuba is always a good one. We have had many such recommendations and many commissions. The English in Bermuda, the Portuguese in Brazil, the French in Martinique, several times the Spanish in Cuba, and our own National Board of Health Commission in Cuba in 1880, are familiar examples of these commissions and their work. Besides these there have been individual investigators almost without number; but in the meantime shall the voice of our Southern Coast be heeded, and either move Ship Island quarantine or surround its anchorage with an adequate naval patrol?

TRANSIENT HEART MURMURS.

The *Lancet* in its issue of Nov. 13, 1897, summarizes an annual address to the Northwest London Clinical Society delivered in October by Sir WILLIAM BROADBENT. The main points dwelt upon are irritable heart and transient murmurs heard over various cardiac and pulmonary areas, with the differentiation of these functional and temporary conditions from organic and permanent disease. Candidates for the public service have sometimes, it is stated, been refused their commissions on wholly inadequate grounds. According to Sir WILLIAM the candidate presents

himself for examination in a state of extreme nervous excitement, his pulse rapid, perhaps irregular, and his cardiac impulse violent and even diffused beyond the right sternal border. Murmurs which sometimes cause rejection simulate closely a soft systolic mitral, but are heard only during inspiration or when the chest is full, and are due to compression of the overlapping lung by the heart during systole. Pulmonary murmurs may depend on bulging of the conus arteriosus against the chest wall; they disappear when the lung is interposed on deep inspiration. Sometimes bruits are heard, not only in the course of the ordinary mitral regurgitation, but over the greater part of the lung. In such cases there is usually pleural adhesion. The criterion of pseudo-mitral disease is absence of displacement of the apex beat and of accentuation of the pulmonic second sound or undue right ventricular impulse, together with absence of symptoms.

Medical examining boards in the United States have already met with experiences of this kind, which should lead to caution lest injustice be done. A board convened at West Point, N. Y., Aug. 20, 1894, reported ten cadets as having become affected with heart disease while at the Military Academy and as being physically disqualified for service, but recommended continuance at the Academy for a probationary period of six months. They were kept under special medical observation in accordance with the directions of Surgeon General STERNBERG, and the report of the medical officer who carried out these instructions, rendered June 23, 1897, when the last of the cadets concerned had become commissioned officers, showed that in nine the heart was free from structural lesion and that there was no symptom of mechanical derangement of the circulation nor of heart strain. In the one case in which the bruit persisted a medical board considered the condition not incompatible with the exigencies of the military service. The conclusion was reached that in all except the last mentioned case the murmur heard in each individual at the time of the examination in 1894 was due to "a temporary irritability of the heart caused by the nervous excitement attending the ordeal of examination." One of these young men, while the subject of medical observation became notable in the athletic events of the Academy, and in March 1897, was awarded the prize for all-round athletics, having won the greatest number of prizes in the individual contests.

These cases convey their own moral.

Twenty-five years ago the Editor of the JOURNAL examined a young carpenter for a Life Insurance Company and was about to reject him, as there was a distinct heart murmur, but he demanded another examination and two days later when perfectly quiet the murmur had subsided so much as to be scarcely audible. At this writing the applicant is entirely well and to all appearance bids fair to become a septuagenarian.

THE PURPOSE AND NATURE OF ACUTE INFLAMMATION.

The leucocytes in acute inflammation not only act as phagocytes and as carriers of bactericidal substances that are secreted or liberated on disintegration, but the presence of leucocytes within formative cells is usually interpreted as signifying an additional supply of food for the rapidly growing cells. KLEBS[1] and RANVIER,[2] in particular, lay stress upon this rôle of the leucocytes. In addition to its bactericidal, diluent and irrigant action the exudate also furnishes the proliferating cells with abundant nourishment. The precipitation of fibrin in inflammatory exudates can also be regarded as beneficial in so far as the fibrinous adhesions often seem to circumscribe the action of the bacteria. The inflammatory proliferation of the fixed tissue cells may be regarded as not only regenerative but as an effort to build a protective wall between the bacteria and the healthy tissue. The experiments of AFANASIEFF show that healthy granulation tissue is a powerful barrier against general infection, the action of its serum and its cells being destructive to bacteria. Here are rehearsed some of the means to counteract harmful agents, protect the organism, and effect healing. As the same principles are seen in response to injury, in defense and in repair in all animals and in practically all kinds of injury, no line can be drawn separating one set of responsive and reparative phenomena as inflammatory from another set a little differently constituted as not inflammatory. The common mode of origin, the similarity of the changes though combined in differing proportions and the recognizable tendency in these changes to protect and repair justify fully the modern teaching introduced largely by METCHNIKOFF[3] that the inflammatory processes are essentially *adaptive, protective and reparative.*

And yet it can not escape notice that the protective and reparative tendencies of inflammation are limited and imperfectly controlled. The reaction is not always in proportion to the strength of the "irritant." The adaptations to the pathologic conditions created are imperfect, as shown by "the excesses, disorders and failures incident to inflammation." The exudation may, as ADAMI[4] says, possess but little bactericidal power or it may carry the bacteria outside the area of primary invasion. The leucocytes and other cells, instead of destroying, may undergo destruction; they may incorporate bacteria but not destroy them, and the bacteria, as in the case of tuberculosis, may continue to multiply; the fixed cells may form imperfect material for repair and continue to multiply excessively; the resulting cicatricial tissue may lead to serious functional disturbances after the harmful agent has been destroyed and repair completed. The

[1] Allg. Pathol. ii, 1889.
[2] Cornil et Ranvier, manuel d'Histologie pathologique.
[3] Pathologie comparée de l'Inflammation, 1892.
[4] Allbutt's new System of Medicine, 1896.

inflammatory reactions do not respect the relative functional and anatomic importances of the organs, but create new conditions that *per se* are dangerous. It will suffice to call attention to occlusion of the larynx in consequence of violent inflammatory reaction, fatal cerebral compression on account of excessive serous exudation in inflammations of the leptomeninx, the contraction and functional disturbances of the valves of the heart from the fibrous tissue produced in repair after endocardial infections, and the overgrowth of connective tissue in the chronic inflammations. These disastrous consequences of inflammation, examples of which can be multiplied, can not always be regarded as unavoidable in order that it could fulfil the purpose of overcoming or diminishing the effects of the primary injury. Hence KLEBS[1] concludes that inflammation is an increase in the reactive changes beyond the degree necessary for restitution. It is an adaptive and self-preservative, and yet often harmful and wayward, process that requires the active intervention of man. Consequently, inflammation, from the clinical standpoint, is harmful; from the pathologic or biologic, a struggle for self-preservation. Inflammation is the reaction of the tissues to local injuries calling forth protective and reparative measures; an imperfect pathologic adaptation often leading to consequences that *per se* are dangerous and defeat its purpose.

HEREDITY AND MENTAL DISEASE.

It has been a matter of general belief amongst the alienists that without predisposition of some kind there would be but comparatively few cases of mental disease. But predisposition in this sense means not only brain weakness or ancestral taint of insanity, but every form of physical or mental deficiency that rendered its subject to any extent unequal to the special condition of stress that produced the mental failure. In this sense any individual of the lower races or of savage or barbarous tribes, and to a lesser extent, of the uncultured and primitive populations of the higher races, so far as he is capable of being affected by the more complex condition of the highest civilization, is mentally handicapped and the more liable to succumb to conditions that are harmless to mental health in others better fitted by culture and evolution and especially by the hereditary accustomance to these special phases of modern life. It is this that, in part at least, brings about the rapid extinction of savage tribes too suddenly introduced to an advanced civilization; besides the diseases and vices introduced among them they suffer from a loss of psychic *morale*, a sort of national apathetic melancholia which saps their vitality and hastens their decay. It is this also that fills our asylums with immigrant foreigners who, accustomed to a simple uneventful peasant life in an old established civilization, are suddenly forced into the struggle for existence under severer competition and in less primitive states of society.

It is therefore not necessary to assume that a direct heredity of insanity is the leading etiologic element in its great extension in modern times; there are other competent factors to largely explain the phenomenon. It is nevertheless a fact that the common notion that insanity is to a very great extent directly inherited, has an ample basis of truth. Asylum medical officials are constantly reminded of this in their daily experience, and asylum statistics offer abundant evidence. One of the latest inquiries into the subject is that of Dr. W. C. KRAUSS, who analyzes the statistics of the New York State hospitals for the insane in the last issue of *Medicine*. He shows that the reports of these institutions give a percentage of 25.38 for the year ending Sept. 30, 1896, and for the eight years since 1888 a slightly lower one of 23.56 of hereditary tendency to insanity in those admitted, including not merely those in regard to whom facts could be obtained, but those in regard to whom no data were obtainable. The figures therefore signify that in about a quarter of the whole number of insane committed there was direct testimony as to an insane taint. But since 1888 the total number of admissions was 41,141, and in regard to 16,914 of these no data as to heredity were obtained. Deducting these the percentage was 35.7 of those of whom some facts could be obtained, and as he admits that there may be some objection to this method of figuring, he assumes that the statistics of one asylum where the proportion of cases without family histories was the least, that at Middletown, can best be taken as giving the true index of heredity as far as the New York hospitals for the insane are concerned. The percentages here are 35.2 for the year 1895–96, and 30.99 since 1888, the unknown cases being practically a negligible quantity—only 172 out of 2,394 admissions since 1888. The proportions here also agree approximately with those of the United States census of 1890, as given by Dr. KELLOGG in his recent textbook on insanity, viz., 31.38 per cent.

It should be kept in mind in estimating the value of these figures that there is a considerable possible, and we may say almost inevitable, source of error in the most carefully collected statistics of this nature—that due to ignorance, family pride, etc. It is always possible that family histories are incompletely given in respect to direct or collateral heredity of mental disorder, as every one who has attempted to collect such data can testify. Very significant facts of collateral heredity are not infrequently innocently withheld, the parties not recognizing their connection with the case. They are also often unknown to those giving the history, and there is beyond this also a certain amount of actual suppression of facts. Insanity is not a very satisfactory thing to have recognized as a

family taint, and there are many who are more than simply willing to conceal it, and to give out the impression at least that its occurrence is purely accidental and unusual. This tendency exists and has to be reckoned with to a certain extent in estimating such statistics as are afforded by asylum reports. Just how much percentage ought to be added on this account, it is hard to say, but it should be an appreciable one and should make us accept the figures as under rather than over the truth.

An homologous heredity of insanity is, however, not by any means the only form to be considered; inebriety, various forms of nervous disorder, and even chronic infectious diseases like consumption, and a host of degenerative conditions appear to alternate in hereditary transmission with mental disorders, and if all these are considered it is doubtful whether we could find any large proportion of the insane who are free from hereditary taint, if indeed we could find any such. Even restricting the responsible heredity to the more marked and serious cases of these disorders we still have such a predominance of their occurrence in the antecedents of the insane as to justify the belief that some kind of degenerative heredity is rather the rule than otherwise. The existing causes of insanity, more especially the so-called moral causes, have, as a rule, little effect on a brain that has no taint of morbid heredity.

Thirty per cent. of all cases of insanity with a heredity of direct or collateral mental disease in asylum statistics signifies a still larger proportion in actual fact, and this again is probably equaled or exceeded by that of heredity of other pronounced degenerative defects. The common belief, which has also good support from high alienist authority, that heredity is the chief cause of insanity, may therefore be considered as well founded on fact.

PHARMACISTS IN THE ARMY HOSPITAL CORPS.

Two or three years ago the American Pharmaceutical Association appointed a committee to work for the fuller recognition of pharmacists in the Army and Navy of the United States, and a bill drafted by this Committee was introduced in Congress providing for a reorganization of the Hospital Corps of the Army. To show in this connection, the high appreciation in which the pharmacist is held in European armies a series of articles were published under the direction of the Chairman of the Committee. From the article on the pharmacists in the French Army, we learn that the Inspector ranks as a Major-General, principals of the first class as Colonels, principals of the second class as Lieutenant-Colonels, with Majors and Aide-Majors ranking as Captains and Lieutenants; and, that although they are the subordinates of the Surgeons "*they have the same income, almost the same uniform and the same marks of honor as the surgeons of the same respective ranks.*" The italics are intended evidently to invite comparison with the enlisted status of the hospital stewards in this country. The bill drafted by the Committee does not, however, purpose making high ranking officers of the stewards. It merely provides that the Hospital Corps, outside of its enlisted men, shall consist of pharmacists who shall not be enlisted but appointed to position by the Secretary of War, and that "upon the passage of this Act all hospital stewards now in the United States Army shall be placed on the list of pharmacists with the rank, pay and privileges of the same, etc."

The Committee does not appear to have studied the constitution and organization of our Army Medical Department and Hospital Corps. The analogues of the pharmacists of European armies are not, in the United States, the hospital stewards but officers of high rank in the Medical Department assigned to the special duty of providing medical and hospital supplies for the troops. One is stationed in New York City, one in St. Louis and one in San Francisco. Surgeon General STERNBERG in a letter which appears in another part of this issue defines the position and duties of the hospital stewards and states how pharmacists, under existing regulations may enter the service.

EFFICIENCY IN HOUSEHOLD DISINFECTION WITH FORMALDEHYDE AND THE AUTOCLAVE, AND WITH A MINIMUM OF INJURY TO FABRICS.

Dr. E. H. WILSON, Director of the Hoagland Bacteriological Laboratory, Brooklyn, reports a satisfactory degree of success in the use of formaldehyde gas generated by means of the TRILLAT autoclave. ROUX, BAUDET, TRILLAT and others have assisted in working out a method of evolving formaldehyde gas from formalin. Formalin, or formol, is a saturated (40 per cent.) solution of the gas in water. If a quantity of solution is mixed with an equal quantity of a 5 to 10 per cent. solution of calcium chlorid, it will be found that the boiling point of the mixture is considerably above 100 degrees C. (212 degrees Fahr.), and the most favorable temperature for evolving formaldehyde gas is between 95 degrees and 100 degrees C. Thus, nearly all the gas is evolved before the mixture begins to give off steam. Moreover, it prevents the polymerization of the gas into trioxymethelene. The following is a partial description, and directions for the use, of the TRILLAT autoclave:

The apparatus is packed in two cases, one of which is the autoclave case containing autoclave with gauge thermometer, two handles and a tin case containing two outlet tubes and a wire to clean same. In the case of accessories is a special lamp and small can containing alcohol to light same; copper can for the formochlorol; tin can for kerosene; cotton wadding for stuffing cracks in windows, doors, etc.; pair of spectacles to protect eyes.

The TRILLAT autoclave: The vessel of the appar-

atus is made of heavy copper, which is silver-lined and has a capacity of about one and one-half gallons. The remainder of the apparatus is mostly brass, highly polished and carefully finished. The cover of the autoclave, which rests on a rubber band so that it can be tightened to avoid any leakage, is equipped with a pressure-gauge, a sleeve in which the thermometer is placed and a stop-cock by which one regulates the escape of formaldehyde gas. The apparatus is heated by means of a special lamp, the flame of which is fed by kerosene vapors. By a small screw one can regulate the heat and by using the pump occasionally one can increase the heat.

Formochlorol is a saturated solution of formic aldehyde and a neutral or indifferent mineral salt and absolutely free from methyl alcohol. When heated under pressure, formaldehyde vapors are evolved in a non-polymerized condition. Before putting the formochlorol in the autoclave, it should be well mixed so as to distribute any precipitate which may be in the same. This deposit is not an impurity, but on the contrary is one of the essential parts of the solution.

Full directions as to the procedure and the methods of bacteriologic testings, too long to be quoted here, are given in an article by Dr. WILSON, in the *Brooklyn Medical Journal* for November. One experiment was done May 27, 1897, in a room having 1,165 cubic feet, with 1,250 c.c. of formochlorol and four hours exposure. The organisms used in this test were those of anthrax, diphtheria, typhoid fever, etc. No moist cultures were used, as it was intended to make the experiment correspond as closely as possible to actual working conditions and in practice we are seldom called upon to disinfect articles that are not dry. The formalin mixture remaining in the autoclave was carefully removed and measured. It amounted to 2,300 c.c. and contained 9.27 per cent. of formaldehyde corresponding to 213.2 grams. As the original mixture contained 500 grams, 286.8 were present in the chamber, and as the capacity of the chamber is 10,188 cubic meters, each cubic meter contains 28.11 grams of CH_2O. This corresponds to a volume per cent. of 1.93, or in round numbers 2 per cent.

This experiment proves that, under the conditions adopted, 2 per cent. is sufficient to disinfect anthrax spores in the middle of a mattress, a very severe test, and, on this account, it is recommended that 2 per cent. be the minimum of gas allowed. As regards the temperature and the vacuum, the experiment shows that a temperature of 65 degrees C. is high enough, and that a vacuum of at least half an atmosphere is desirable. It will be seen that the temperature exercises a marked effect on the disinfection, and the failure of the first experiment, where a much larger percentage of gas was used, must be attributed to the low temperature at which it was conducted.

This method, therefore, gives a convenient and satisfactory disinfection of goods that would certainly be injured, if not ruined, by the use of steam.

The advantages of the autoclave over the lamps are at once apparent: 1. It produces a large volume of the gas. 2. Rapidity of application. 3. It is constantly under observation and located outside the room. 4. No damage to disinfected goods.

The experiments with lamps previous to this apparatus have been instructive. As long ago as November 1895, we began at the Hoagland Laboratory a series of experiments with this gas. At that time ADNET, in Paris, had devised the first of the lamps. We sent for one, and after the usual delay we obtained a lamp from ADNET, and, using that as a model, we had a lamp constructed containing more burners. ADNET'S was a single-burner lamp, something like a student's lamp, having a receptacle for the methyl alcohol and a cone of platinum gauze on the other side. This lamp made a very bad odor in the room, but it was difficult to tell how much was due to the formaldehyde and how much was due to the unoxidized methyl alcohol. We placed it in an ordinary clothes-press, such a closet as one ordinarily finds in a sleeping room, so that all of the cultures exposed to the action of the lamp were within five feet of the burner. The result was, we could not, no matter how long we left the lamp in, succeed in killing dry diphtheria cultures; we did succeed with moist cultures, but the dry ones always survived. Then we had a lamp made with four burners, and after that one with eight burners, and we took that out to the Kingston Avenue Hospital and put it in the isolation pavilion and tried the same cultures there, and we drove everybody off the grounds, with the exception of the test-organisms, and we came to the conclusion that lamps were impracticable and rather dangerous for use in the Health Department, because very often such a lamp, in the hands of an unskilled or careless man, if put in a room and started might set fire to the house.

It is true that very many manufacturers are now engaged in the production of these lamps. I think within a month we have received as many as a dozen circulars from different manufacturers in regard to these lamps and they make extravagant claims for them, which on careful investigation I am sure will not be borne out. I would suggest a scheme which seems to me is a very feasible one, and one which could be readily carried out: That the Health Department furnish to physicians who desire to do such disinfection a package of test-organisms and let them put it in the rooms with their lamps and return the package to the laboratory, and learn the next day whether their disinfection was efficient or not. I think that this would settle the question of lamps very shortly.

This apparatus which I show you is imported, and the duty brings the cost of it up; it costs $100; but I received a circular today from a firm in New York, who manufactures an apparatus almost like this. It seems from their prospectus to be very efficient. It is in three sizes, the smallest size costing $30 and the largest for hospital use, $100. The one for $30 has about the capacity of this one.

CORRESPONDENCE.

Reminiscences of a Recent Visit to the Twelfth International Medical Congress at Moscow, Russia.

CAMBRIDGE, MASS., Nov. 26, 1897.

To the Editor:—The International Medical Congress at Moscow, August 19–26, was under the high protection of His Majesty, the Emperor Nicholas II. and the August Patronage of His Imperial Highness, the Grand Duke Sergius Alexandrovitch.

There were held three general sessions, which took place in the Grand Théâtre Impérial. Admission to a session was by card, which was issued by the committee having the matter under control. The number of delegates and registered members was so great that the invitations had to be limited to the

seating capacity. Most of the members, however, had during one or more of the three sessions an opportunity of witnessing the manner in which the general work was conducted. I was fortunate in receiving a card that admitted me to all the exercises. The opening session was the most important, on account of the presence of the Grand Duke and the high officers of the Imperial Court. The introductory discourse and address of the welcome given by the President of the Committee of Organization, Prof. N. B. Skliffosowsky, was in full accord with his ever watchful and sympathetic audience. The report of the Secretary-General, Prof. W. K. Roth, on the progress of the work of the Congress, on the large number of valuable contributions that had been promised and the unprecedented number of delegates that had already registered commanded the closest attention and approval. It was indeed a moment of supreme delight to have the opportunity of observing the dignity and, if I may be allowed to say, the grandeur of the man who for nearly three years past had performed that Herculean task of carrying on by the most skilful use of the French language, the extended correspondence necessary for the success of such an international meeting as was then taking place at Moscow.

The official addresses of the representatives of the various governments were an interesting feature of the opening session. The address of Prof. Virchow on "Die Rolle der Gefässe bei Entzündung" was the occasion for rapturous applause. The speaker's very presence stirred the soul of the Congress and added a charm to the great gathering that will not soon be forgotten, and though he had passed his 76th milestone, the quick flash of his eye, the merry play of his countenance, his keen wit and engaging manners, recalled to mind our student days when his work entitled "Cellular Pathology as Based upon Physiologic and Pathologic Histology," was regarded as the highest authority on the subject and was read with almost as much interest as a novel.

An address entitled, "The Classification and Surgical Treatment of Acute Peritonitis," was delivered before the second general session by our countryman, Dr. Nicholas Senn. The address was interesting and instructive and impressed the hearers that Dr. Senn was a thorough master of the subject with which he was dealing.

Perhaps one of the most brilliant efforts made by any speaker was that of Professor Lannelongue, who had for his subject "Surgical Measures to be employed in Tuberculous Cases." The speaker exemplified in his address the fact that the French vernacular was well adapted for the highest flights of "soul-ravishing eloquence."

The address of Professor Leyden of Berlin entitled, "Ueber die gegenwärtige Behandlung der Tuberculösen und die staatliche Fürsorge für dieselben," was looked forward to with perhaps more than ordinary interest, from the fact that he had been identified in some measure with Professor Koch in an endeavor to solve the question as to the best method of treatment for tuberculosis. As far as I could understand his address, which was delivered in German, he did not regard the use of tuberculin as a specific; the Professor relied more on climatic influences, upon the advantages of a residence in elevated centers where there is an abundance of sunlight and fresh air free from moisture. In cases, however, where the patient is feeble and there is much febrile disturbance and profuse hemoptysis, high altitude would be, for the most part, contra-indicated.

The addresses of Professor Krafft-Ebing of Vienna on the "Etiology of Progressive Paralysis," of Professor Metchnikov of Paris on "The Pest," of Professor Robert of Barcelona on "Certain Pathologic Characteristics of the Human Economy," of Professor Lombroso of Turin on "New Horizons and New Applications of Psychiatry," of Professor Loukanov of St. Petersburg on "The Inanition of the Cell Nucleus," and of Professor Lauder Brunton of London on "The Relations between Physiology, Pharmacology, Pathology and Practical Medicine" also met with warm response and would compare favorably with the great productions put forth by speakers on similar occasions.

There were in attendance, including the women, upward of 10,000, of whom, according to the Secretary-General, 7,500 were delegates and registered members. More than half that number were from Russia. Germany sent upward of 800. The number of Austrians was nearly the same, while the number of French exceeded 400. Italy's quota was not far from 300, and England's list of delegates, notwithstanding the great attraction of the meeting of the British Medical Association at Montreal, Canada, was nearly as large as that of Italy. Sir William MacCormac and others of her illustrious members of the profession were in attendance. Scandinavia, Holland, and the remaining European countries were well represented. Delegates appeared from China, Japan and other Asiatic regions, and also from South America. Mexico sent Professors Licéaga, Lavista, Heréra, Noriéga, Carbajal and fifteen other delegates. The number of representatives from the United States was 124, of whom 37 were delegates from the AMERICAN MEDICAL ASSOCIATION; of this latter number there were from Cambridge besides myself two of our most worthy and eminent physicians, Dr. John L. Hildreth and Dr. Edmund H. Stevens. The closer sympathy or nearer touch in which were brought our American delegates and their gracious ladies and pleasing friends is to be counted as no inconsiderable part of the pleasure realized in journeying to such a distant meeting, the Mecca scene of our profession.

The number of papers presented to the Congress was not far from 1,000; the work was divided into twenty sections. The Section on Surgery had a large attendance. The titles of 140 papers were entered. Such names as Macewen of Glasgow, Doyen of Paris, Roux of Lausanne, Beck of New York, Czerny of Heidelberg, Ollier of Lyons, Israël of Berlin, Championnière of Paris, Oppenheim of Berlin, Murphy of Chicago, Tauber of Warsaw, and Preobragensky of St. Petersburg, when arrayed with those of many others no less illustrious, ought to be sufficient to indicate that good work was accomplished.

Surgery of the lungs was a prominent theme for consideration. In cases of abscess and gangrene of the lung, pneumotomy was regarded as sometimes indicated. The occurrence of cases of large tuberculous cavities in which there are distressing or immediately dangerous symptoms may sometimes demand incision and drainage for relief. In some cases of such disease, resection of one or more of the ribs in order to secure proper drainage was deemed advisable. Dr. Jacob Frank's demonstration of his "New Absorbable Intestinal Coupler" as a substitute for the "Murphy Button" attracted much attention.

The Section of Obstetrics and Gynecology, in which I registered, occupied the larger share of the time at my disposal. In this Section the titles of seventy papers were on the program. Professors Makéiev and Snéguirev of Moscow were the principal managing officers and were associated with thirteen members of the Committee of Organization. Seven secretaries were appointed to facilitate the work of the Section. The meeting of this department took place in the spacious hall on the second floor of the old University. It was a brilliant gathering; on the walls near the main desk hung a magnificent painting in oil of the Emperor, while on the right was also an exquisitely finished picture of a former empress. Behind this stand for the various speakers was placed a sounding board which improved the acoustic properties of the hall. At a long table sat the managing officers of the Section, the various members of the committee, the honorary presidents, prominent speakers and invited guests. The secretaries' table was on the right and the reporters' table on the left. The other members

and those who came to witness the proceedings occupied seats outside of the enclosure. The number in attendance was for the most part always sufficient to fill the hall to its fullest capacity. The Chairman, Professor Snéquirev of Moscow, began his address by taking for his motto that beautiful saying of Malgaigne, "Verité dans la science, moralité dans l'art." His reference to Raphael's Sistine Madonna was most happy; he affirmed that the beauty and health of the woman with the child in her arms, as personified by the artist, was no mythical or unrealizable representation; it is a perfect type of healthy and beautiful womanhood. It is the duty of science to contribute to such an end; we must therefore care tenderly for the child if we would preserve the race of mankind. By studying the phenomena of nature and assisting woman in conserving her energies, mutual love and respect will be strengthened and thereby her rights be increased and her duties materially lessened. In the paper on "Symphyseotomy," by Professor Varnier of Paris, the author remarked that the operation was no more dangerous in properly selected cases than were other recognized obstetric procedures. The operation could be resorted to in those cases in which the child was alive, the dilatation of the os and cervix was complete, the membranes were ruptured and the efforts at expulsion insufficient to effect delivery owing to the disproportion between the fetal and the maternal structures. The author's experience appeared to warrant him in saying that perfect restoration of the parts, after a resort to this means for relief usually took place by primary intention. The operation could without incurring permanent inconvenience be had recourse to, if necessary, several times on the same woman. The paper was ably discussed by Zweifel of Leipzig and Borsi of Genoa. The question relating to the advantages of colpotomy in cases of inflammation of the adnexa, of displacements and of neoplasms of the uterus was ably discussed by Candela of Valencia, Doyen of Rheims, and Dührssen and Martin of Berlin and Farza of Barcelona.

Surgical treatment for peritonitis was another favorite subject for consideration. The discussion was carried on by Martin of Berlin, Winckel of Munich, Christovich of Salonica and Noriéga of Mexico. The consensus of opinion was favorable to a timely resort to operative procedures. Serotherapy, when employed in puerperal septicemia, was endorsed by Bar and Wallich of Paris, and Weinstein of Odessa.

"The Comparative Value of Different Operative Methods in the Treatment of Uterine Cancer and as the Means of Preventing Return of the Disease" was the subject of a paper by Winter of Berlin, and was freely discussed by Goubarev of Moscow. In this connection Doyen of Paris, took for his theme "Total Extirpation of the Uterus," and Landau of Berlin had for his paper, "Total Etirpation of the Uterus by the Abdominal Method." He also presented a report on 500 cases of total extirpation by the vaginal method with varying results. Among other speakers who discussed different themes were Peau of Paris, Wedorodoff and Goubarev of Moscow, Ott of St. Petersburg, Apostoli of Paris, upon the application of a new galvanic current (ondulatoire) to be employed in gynecology. Of the other speakers who presented papers on discussed subjects were Torre of Rome, Leopold of Dresden, Müller of Bern, Olshausen of Berlin, Weugebauer of Warsaw, Borav of Moscow, Cameron of Glasgow, Hennig of Leipzig, Pinard of Paris, Simpson of Edinburgh, Woltchini of Moscow, Rosner of Cracow, Twesternark of Stockholm, Colderini of Bologna, and Cholmogoroff of Moscow. "Perineorrhaphy, Immediate and Secondary," was the title of the last speaker's paper.

During the discussion of the several subjects the managing officers of the Section, Professors Makéiev and Snéguirev, were active in arranging matters that would expedite the work, while the honorary presidents were called upon in turn to preside and to control the discussion according to the manner that had been determined upon by the committee. In the consideration of questions of operative technique beautifully prepared diagrams and drawings upon the blackboard were freely brought into requisition. The discussions ranged upon a great variety of topics growing out of the subjects presented in the papers, and were carried on by the several speakers in a most earnest, courteous, and dignified manner.

All the work accomplished tended to unite in kindly feeling the members one with another, and to render the meeting a scene of memorable occasion. After a speaker had taken part in the consideration of a subject that was not in his paper, he was presented by one of the secretaries with a card and pencil, that he might note down the leading points of his argument; this part of the regulation was strictly observed and was carried out to good advantage.

At 4:30 P. M. on August 24, the work of the Section was brought to a close. After a few words complimentary to the officers and the Committee of Organization, by Winckel of Munich, Torre of Rome, and others, the parting benediction was given by Professor Makéïev and by the chairman, Professor Snéguirev. It could not be otherwise than a season of pleasure to draw near the men whose names have in works of great importance, been so long familiar to us, and to see them facing each other, not with the purpose of advancing a dogmatic theory, but with a sincere desire to assist in the elucidation of that truth which would be of the highest advantage to suffering humanity.

The dinner given at the opening meeting of the Section by Professor Snéguirev and M. Schélapoutine, the founder of the Institute Gynécologique de Moscow, at Pocrowsky-Fili, was a most enjoyable occasion. The distance was some seven versts or three kilomètres from the Barrière de Dorogomilowo. The place was reached by carriage and in driving it was necessary to pass beyond the house (Koutousovskaïa Izba) designated by an inscription and celebrated for the Council which was, under the presidency of General Koutouzov after the battle of Borodino, during the French invasion in 1812, there held for the purpose of determining the expediency of evacuating the city of Moscow.

The dinner was followed by addresses and the rendering of vocal selections. It was attended by the officers and the committee of the Section, invited guests, and hostess, Madame Schélapoutine. Dr. Parvin and myself were, I believe, the only Americans who were present. As we returned at a late hour, by moonlight over the winding roads, through groves, open fields, and along the Moskva River, Moscow in the distance with her thousands of brilliant lights illuminating her many domes and pinnacles, and with her other semi-oriental adornings, had the appearance of a fairy city and presented a view that was most enchanting.

No one who is versed in the affairs of nations can doubt that the future of Moscow will be most favorable to her development, and that when the railway construction, which is being extended on a gigantic scale through Siberia and other parts of the Russian Empire, has been completed, this ancient capital will, by the importance of her situation, become one of the greatest emporiums of the eastern hemisphere.

The Institute of Gynecology has recently been constructed and was founded, as before remarked, by M. Schélapoutine in memory of his mother. A visit to the institution showed that the buildings were well situated and equipped with modern appliances and conveniences; that the appointments were excellent and the work carried on would compare favorably with that accomplished in the best hospitals of other places. Moscow has been famous for its institutions for promoting the different branches of medical science and for extending relief to the unfortunate, through the liberality of its hospitals, dispensaries and *cliniques*.

The Imperial Foundling Hospital is the largest infant asylum

in Europe; it affords an annual refuge to 17,000 abandoned children and occupies 81,800 square meters of land. It has for its number of inmates, including attendants, 7,000.

The Section dinner given at the Chasseurs Clubhouse, at Rue Wosdvijenka, on August 25, was the occasion for another pleasant reunion. Most of the Sections had dinners during the same evening; the speeches and toasts following proved most entertaining and the opportunities that were there presented for conversation and kindly greetings have, as regarded by many, been rarely surpassed. At the close of the third general session addresses appropriate to the occasion were, as done in some of the Sections, delivered by the president and by prominent members from different countries.

The next congress is to be held in Paris in 1900. Professor Lannelongue was chosen president of the Committee on Organization and Professor Chauffard, Honorary Secretary-General.

In regard to the nature and character of the work accomplished by the Congress there can be no question as to its great importance to humanity and to the profession generally. There may have been encountered embarrassment by the use of some of the various languages that were officially allowed in the reading and the discussion of papers, but this feature could not have been a serious drawback to one who was acquainted with the general principles of subjects. The fact as already intimated, that so many noted delegates from France, Germany and other countries were present and took prominent part in the consideration of the work, is evidence that the meeting must have been productive of far-reaching results.

The committee of Russian dames having the approval and support of the Grand Duchess Elizabeth Feodorowna, and the advantages of the position of their ubiquitous president, Madame Sklifossowsky, are deserving of great credit for their arduous endeavors in planning and carrying out, on a most magnificent scale, a series of entertainments for the visiting bodies to Moscow. The features of these entertainments were of a social, historic and artistic nature, and were thoroughly enjoyed not only by the fairer sex, but by the gentlemen.

In closing I might say that the medical gentlemen of Russia have long since been recognized by the faculties of other leading nations; they have always been in close sympathy with the great merchants and with the commercial interests of their country. They used to good advantage their influence in securing the large appropriation from their government, beside contributing freely of their own substance toward bringing the work of the Congress to a most successful issue. They extended a most hearty welcome to their visitors. Their courtesy was phenomenal and their solicitude for the welfare of all is indeed worthy of emulation. The following from Dr. Leusser-Lissingen's "Farewell to the Congress of Moscow," expresses my feelings in regard to my visit in Moscow:

"Wahrlich, schwer wird's mir zu scheiden,
Gar zu gerne war ich hier.
Lass mein Herz sich nochmals weiden,
Heilige Stadt, an deiner Zier!
Lebe wohl, mein trautes Moskau,
Märchenschöne Kremelstadt!
Niemals wird mein Herz vergessen
Was es hier empfunden hat."

AUGUSTUS P. CLARKE, A.M., M.D.

"Treatment of Inevitable Abortion."

BLOOMINGTON, ILL., Dec. 1, 1897.

To the Editor:—I read with interest, and with a large measure of approval, the concisely stated contribution of Dr. H. P. Newman on the "Treatment of Inevitable Abortion," in our JOURNAL of 27th ult. A paper on the subject of abortion before any medical body, or village society, or an international gathering, invariably elicits a spirited discussion, plainly indicating that there yet remains much to be desired in the management of such conditions.

The diversity of views usually expressed, tending all the way from a dull, blameable conservatism to dangerous radicalism, further indicates that all methods are unsatisfactory at times, disastrous often, and that the desired middle ground of action has not been reduced to a formula, embracing every probable situation. A careful analysis of Dr. Newman's article indicates clearly enough that he believes in and practices the rather advanced radicalism, and defends his position by his own results and the general tendency of the times in his direction.

The immediate danger, as stated by him, is hemorrhage; the degree of danger increasing with each day of gestation. To the third month, or rather to the time of definite formation of the placenta, the danger from hemorrhage is slight, but the remote probabilities of chronic metritis, subinvolution, salpingitis, etc., are considerable. Now when dangerous hemorrhage follows an interrupted pregnancy, there is no time lost in calling the doctor, and he in turn loses none in checking it, and in the vast majority of cases succeeds. In calculating from whence come the great number of unfortunate victims of the "remote probabilities" that throng dispensaries and gynecologic hospitals, we seldom take into account the large proportion that have never had treatment of any kind. From motives of concealment, economy and shame many women never consult a medical attendant, thereby losing the opportunity of preventing just such conditions as named above, and which the sensible treatment of Dr. Newman would avoid. Hence, from whatever point we view this matter, control of hemorrhage, avoidance of chronic pelvic disease, or sepsis, we inevitably reach the conclusion that far better results can be expected from this real conservatism of Dr. Newman than from the dangerous conservatism of chance. It may be depended on with positive certainty that the uterine contents, after the rupture of the amniotic sac, will be infected from the vagina within a very few hours, and a rational plan of treatment immediately suggests a clean, sterile uterus, and as that desirable condition is within reach of any skilful practitioner, there is but small excuse for the waiting plan. Those who advocate it never leave a woman with a leaking uterus, possibly a fetid one, without wishing the contents evacuated, and with the half fear that the inevitable tampon is simply blocking the way. Why then be burdened with this apprehension? The contents can be easily and safely gotten rid of, and why not have at least the satisfaction of seeing the source of danger where it will do no harm?

If hemorrhage is the urgent symptom, immediate emptying of the womb is conceded to be the prime necessity, and everybody does it and generally with gratifying success. If the hemorrhage continues and the uterus is not contracting promptly, pack it and pack it well with sterile gauze. You will not be doing your duty unless you do this. It matters but little whether the curette is large or small, dull or sharp, so you use it sensibly. You may not use the curette at all, and depend on thorough packing for the double purpose of controlling hemorrhage and separating the secundines from the uterine wall. In removing this packing you are many times rewarded by the expulsion of the embryo, sac and placenta at the same time. This is a pleasing result and you know then you will have no curette dangers to be afraid of. You have not only checked a hemorrhage, but you have lessened the chances of fatal septicemia and of an infected uterus and the consequent "remote probabilities" so woefully damaging to multitudes of women.

There is another point in Dr. Newman's paper which is not quite clear and possibly a trifle contradictory. He classes hemorrhage among the *immediate* dangers and further on goes deliberately about its control with the same preparatory technique that he does in a vaginal section, bath, sterilization of genitals, starvation for anesthesia and "free catharsis."

This usually takes twelve to twenty hours, and what about the hemorrhage *ad interim?*

In the main I consider the method outlined by Dr. Newman as sensible and practical and that it will meet the requirements in most cases, while at the same time it is so simple and rational that every general practitioner could skilfully carry it out in every necessary detail.

When, however, the embryo and its envelopes and placenta are not diseased and there has been an accidental rupture of the sac, we are confronted with "inevitable abortion" and I can hardly indorse the use of the curette unless there is actual or impending hemorrhage to a dangerous degree. The placenta and membrane are very firmly attached and dip deeply down into the uterine tissue, and a degree of force would be requisite to dislodge them that is not within the limits of safety.

There may be wandering abdominal and loin pains, but the uterine contractions are not sufficiently strong to expel the conception. In this condition it has been my practice for years, to moderately dilate the cervix with Goodell's or Palmer's dilator, remove any presenting fragment and thoroughly pack the womb with sterilized gauze, leaving a fairly close packing in the external canal. Then institute Dr. Newman's preparatory toilet and at the end of twenty or twenty-four hours, when the gauze is removed, in nearly every instance, the uterine contents will easily and bloodlessly pass away. In the event they do not you are then prepared for curettage.

As the paper of Dr. Newman treats only of "Inevitable Abortion," there need be here no reference to the wandering and mostly irrelevant discussion that followed.

507 Greisheim Building. FAYETTE DUNLOP, M.D.

The Status of Hospital Stewards in the Army.

Letter of the Surgeon-General of the Army to a Committee of the American Pharmaceutical Association.

WAR DEPARTMENT, SURGEON GENERAL'S OFFICE,
WASHINGTON, Dec. 1, 1897.

MR. GEORGE F. PAYNE, Chairman of Committee, American Pharmaceutical Association, Atlanta, Ga.

Dear Sir:—I have received your letter of November 29, also communications from pharmacists in various parts of the country, urging me to support the bills which have been introduced relating to the status of hospital stewards in the army.

There is a misapprehension on the part of pharmacists with reference to the position of hospital stewards. These non-commissioned officers have many other duties quite as important as those connected with the dispensing of medicines, and at our larger posts they usually do not give personal attention to the preparation and dispensing of medicines. This is done by an acting hospital steward, or at times, by a detailed private of the hospital corps. While we require hospital stewards and acting hospital stewards to pass an examination which includes some knowledge relating to the action and doses of the principal medicinal agents, we do not ask for any great proficiency in the art of the pharmacist. This is not essential, inasmuch as our medicines are largely supplied in the form of tablets and pills, and our tinctures and fluid extracts are purchased from the manufacturers.

It is quite as important for us that the hospital steward should have experience in the control of men, in the making out of official papers, in the drill of the hospital corps and in the general management of the post hospital. These things he learns by coming up through the ranks from the position of private in the hospital corps to that of acting hospital steward and finally hospital steward. This method enables us to ascertain his qualifications and to estimate his character and capacity before he is finally appointed to the highest position. A graduate in pharmacy would not be competent to fill the position of hospital steward unless he had had this previous experience.

I shall, therefore, not support any bill which proposes to appoint graduates in pharmacy directly to the position of hospital steward. But a graduate in pharmacy who desires to attain that position can enlist in the hospital corps with a view to promotion, and his education and knowledge of pharmacy would give him a great advantage over all competitors in obtaining a detail as acting hospital steward, and subsequently an appointment as hospital steward. Nor do I think it would be in the interest of the service to make hospital stewards commissioned officers. Their present position is a most honorable one. They are highly respected by the officers of the army, and the position is eagerly sought by educated young men. Any reasonable proposition which may be made with reference to an increase in the pay of hospital stewards will receive my hearty endorsement. Very truly yours,

[Signed] GEORGE M. STERNBERG, M.D.,
Surgeon-General United States Army.

The Coming Meeting of the Association at Denver.

TECUMSEH, MICH., Nov. 29, 1897.

To the Editor:—The editorial in the JOURNAL of November 20, under the heading "Influence and Environment of Medical Men," is well worth the perusal of every member of our profession. The article alluded to particularly points out the absolute necessity and special benefit these National gatherings have on the physician who attends them, irrespective of his home surroundings.

The author further states that, "The coming meeting should bring out two thousand physicians." But should it not bring out five thousand?

If the Committee on Transportation can obtain the same railroad rates that are given to stockmen's conventions, butcher's conventions, political conventions of all sorts and shades, Christian science and similar crank conventions, we should have at least five thousand physicians at the Denver meeting, instead of two thousand, as anticipated by the JOURNAL.

Respectfully yours, J. F. JENKINS, M.D.

A Water Company Sued.

MILWAUKEE, WIS., Dec. 4, 1897.

To the Editor:—Some years ago there was an epidemic of typhoid fever at Ashland, in this State. The water-supply was furnished by a company, and it was believed that the epidemic was due to the contaminated water taken from Chequamegon Bay. The water company extended its pipes, and later put in a filtration system, which has resulted in giving pure water. In the meantime a Mrs. Green sued the company for the death of her husband, and claimed damages amounting to $5,000. This case was recently tried at Stevens Point, the case being taken from Ashland on a change of venue; much expert evidence was produced on both sides, and the jury decided in favor of the plaintiff, giving her $5,000 damages. This was done in spite of the fact that the only evidence produced that the man died of typhoid fever was the symptoms given by the attending physician. No autopsy was made nor no bacteriologic examination of the discharges from the bowels whatever. The case will be appealed to the supreme court.

U. O. B. WINGATE, M.D.

Correction.

HOT SPRINGS, ARK., Nov. 26, 1897.

To the Editor:—On page 1065 of your JOURNAL, in the discussion of the paper by Dr. C. A. L. Reed, entitled "Gall Stones in their Relation to Cancer of the Gall Ducts," in the last line on said page the reporter makes me say that I had

"seen cancer of the *uterus* unmistakably produced by gall stone infection." Of course there is a mistake in this on the part of the reporter. It should have been "liver" instead of "uterus." Yours truly, JAS. T. JELKS, M.D.

The Late Prof. Harrison Allen.

PHILADELPHIA, Nov. 30, 1897.

To the Editor:—Will you kindly insert the following notice in your paper? At a meeting of the Philadelphia Neurological Society, held on November 22, the following action was taken:

WHEREAS, The Philadelphia Neurological Society has heard with great regret of the death of Dr. Harrison Allen, it desires to offer its sympathy to his family and to give expression to its sense of the great loss which has been sustained by science and the medical profession. Dr. Allen was deeply interested in neurology, not only as a human and comparative anatomist, but also in various practical directions, as indicated by his valuable contributions to this Society and other medical bodies.

CHARLES W. BURR, President.
WILLIAM G. SPILLER, Secretary.

PUBLIC HEALTH.

Department of Public Health Bill.—At the semi-annual meeting of the Oklahoma Territorial Association held in the city of Oklahoma, Nov. 18, 1897, the following resolutions offered by Dr. C. D. Arnold of El Reno, were passed without a dissenting voice:

Resolved, 1, That this Association desires to express its sympathy for the AMERICAN MEDICAL ASSOCIATION and its organ, the JOURNAL, in their untiring efforts to induce Congress to create a National Department of Public Health, and heartily endorse the Association Bill approved by the American Public Health Association, at its late meeting in Philadelphia.

Resolved, 2, That this body request the Oklahoma Delegate in Congress, the Hon. J. Y. Callahan, to use his influence in passing the bill; and further, that each member of this Association endeavor to at once procure a copy of said bill and familiarize himself with all its valuable features, and write to such representatives in Congress as he is personally acquainted with in the States, urging them to support the Bill.

Resolved, 3, That a copy of these resolutions be sent to the Hon. J. Y. Callahan, one copy to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, one filed with the transactions of this Association, and (as amended by Dr. G. E. Keeby) each member be supplied with a copy.

J. A. HATCHETT, President.
F. S. DEWEY, Secretary.

Health Boards and the Public Weal.—The determination of the New York Health Department to destroy a building as "not fit for human habitation and not capable of being rendered so" has been upheld by the Appellate Division. On the appeal, only the pleadings, decision, and exceptions thereto and the judgment were before the court, the appellant's counsel contending that the grounds specified in the decision were insufficient to warrant it, and that consequently no consideration of the facts was necessary. Justice Barrett, giving the opinion of the court, holds that, under the amendments of 1894 and 1895, to Section 1022 of the code, all that is necessary for the court is to state the grounds on which the issues have been decided; and whether the conclusions of law are justified by the evidence can not be decided on appeal where there are no distinct findings of fact and where the court has not the evidence before it. Averments were distinctly made in the petition in this case which, Justice Barrett said, if proved in their entirety would establish the fact that the condemned building was a public nuisance and that it should be abated. The court must assume, upon the record, that the judgment was rendered upon adequate proof of every fact so averred in the petition.

A New Disinfecting Steamer at the Quarantine Station of New York Harbor.—The health officer of the port of New York, Dr. A. H. Doty, has added to his equipment a disinfecting steamboat, the *James Wadsworth*, with an improved method for the application of steam. The latter is described as consisting in the exhaustion of the air in the chamber so as to produce a partial vacuum before the steam is admitted, and it is found that, all other circumstances being alike, a temperature of 240 degrees, that of the steam in the chamber, is reached in the interior of a matress or like article in less than three minutes with the vacuum, though without it from ten to fifteen minutes are required. The oven is constructed with double walls and is encased in a jacketing of asbestos, which so prevents the loss of heat by radiation that the room in which it is fixed is not perceptibly warmer than others in the vessel or building. The special feature, however, is the steam exhaust, which consists simply of a powerful jet of steam coming directly from the boiler, where a pressure of sixty-five pounds to the square inch is maintained, passing across the mouths of 1½ inch pipes connected with the chamber of the oven and with the space between its inner and outer walls. A similar pipe communicates between the chamber and the outer air and the steam is admitted by one of 2½ inch in diameter, furnished with a regulating nozzle by which the pressure may be reduced to fifteen or twenty pounds, which is sufficient for a temperature of 240 degrees in the chamber. All these pipes are provided with stop-valves. The operation, after articles to be disinfected have been introduced and the doors securely closed, is to set the steam exhaust to work until the manometer or steam gauge indicates a pressure in the chamber and surrounding wall space of not more than twenty inches, a partial vacuum which is attained in about one minute. The valves are then closed and the steam pipe opened, when the superheated vapor entering under a pressure of two atmospheres, into the rarefied atmosphere of the chamber, penetrates the densest fabrics and stuffed or packed goods, raising their temperature throughout to its own in three or four minutes. Ten minutes at 240 degrees destroys bacilli of plague and anthrax, however protected, with absolute certainty, so that in fifteen minutes from the commencement of the process the steam may be turned off, when the steam exhaust is again set in action, though on the chamber only, until the former vacuum has been restored; then the air inlet is opened and the exhaust still acting draws such a powerful current through the chamber that in two or three minutes every trace of moisture has been removed and wearing apparel may be resumed within less than half an hour of its having been given up, an interval clearly none too long for the bath and cleansing of the persons of the wearers.

A Dangerous Intramural Cemetery.—The necropolis of Liverpool is situated in about the center of that city. Although it occupies a space not much larger than a good-sized city block, it receives hundreds of interments yearly. In the five years ending January, 1896, 2,255 bodies were added. The largest number of interments appear to take place at the necropolis. No notice is required to be sent to the sanitary department when these interments take place, but occasional visits are made to this burial ground. Here there is an arrangement of tiers, separated by a course of flagging, and with brickwork between each coffin. The walls between the vaults are four and one-half inches in thickness, and a stone flag covers over the top course of coffins, about two feet six inches below the surface of the ground. The vaults contain about thirty-six coffins, and it is probable that, within an area ten yards square, there will be over 300 bodies of adults and children. Interments in this greatly overcrowded graveyard not only take place in family graves and vaults, but new graves are also being opened. The approximate number of interments (not including still-borns) which have taken place in the cemetery since it was opened is 82,341. There is said to be accommodation for 2,160 more bodies, besides graves already sold, but which have not yet been fully utilized. The inhabitants of the houses

abutting on the necropolis have, as a whole, occupied them but a short time. Many of them complain of offensive smells, which they believe come from the cemetery. In many instances the occupiers also state that their houses are infested with mice of a peculiar light fawn color, which they believe come from the cemetery. Some light may be thrown upon the probable condition of the subsoil in this city graveyard from the following extract from a report by an inspector of the city engineer's department. It will be noticed from this report that the offensive condition described was in that part to which material from the burial grounds would be most likely to gravitate. It was not found in the sewer nearer the surface. "The sewer in West Derby Road is what is known as a rock sewer and is cut in the sandstone. It is about fourteen or fifteen feet below the surface, and is between two and three feet in width. This sewer was undergoing reconstruction in 1889. The bottom was very much worn and 'liners' were to be put in. The top is arched over with brick, and the sides were to be cased. When opposite to the necropolis in West Derby Road, a large quantity of black jelly was found adhering to the side of the sewer nearest the necropolis, the other side was the natural color of the rock. When this material was touched or pricked, it emitted a frightful stench. The opinion of the other men and myself was that it came from the burial ground. One of the men at work was taken seriously ill, and died while the work was in progress. The other men objected to work there. The jelly was scraped off, and several coats of cement put on to try and keep the stuff from oozing through. There is also another sewer in West Derby Road which runs above the preceding one at a slight angle. This sewer is only about nine feet below the surface, and is supposed to drain the burial ground. The vaults in the burial ground are about fourteen or fifteen feet deep. This sewer is of similar construction to the other and was reconstructed at the same time. None of the jelly material was found in this sewer. None of the material was found in the Everton Road sewer, which is about nine feet below the surface. The jelly was only found in that particular length of the sewer outside the necropolis." —(From report of Dr. E. W. Hope, Health Officer of Liverpool for the year 1896.)

ASSOCIATION NEWS.

Section on Diseases of Children.—At the Jubilee Meeting of the AMERICAN MEDICAL ASSOCIATION a motion was made, in the Section on Diseases of Children, that the ASSOCIATION endorse the organization of the American Pediatric Society. The discussion on this subject was as follows:

Dr. COOK—There are many people who desire to study pediatrics as a specialty and it seems to me they should have that privilege. Therefore I move that the organization of the American Pediatric Society receive the endorsement of this Section of the AMERICAN MEDICAL ASSOCIATION.

Dr. FOSTER—From the remarks Dr. Love made yesterday afternoon I gathered that the idea was for the membership of that society to be rather select. I understood from his remarks that it was to be confined to teachers of pediatrics, barring out a certain number of us poor fellows who might possibly like to belong to it and like to attend it otherwise than just as *visitors*. If the teachers form a society they have a right to do so, but it seems to me with that restriction such a small meeting as this should not bind the Section to any such endorsement.

Dr. COOK—The lines have to be drawn somewhere to form the society, and it seems to me the hospital connection in that line gives one the privilege of belonging to the society.

THE CHAIR (Dr. LARRABEE)—Dr. Cook is right. Perhaps it would be better for the Chair to state that he has some knowledge of the preliminary organization of this Association and that the qualification of membership is that the party must be connected with some institution for the treatment of children or be a full professor of pediatrics, or that he should have been in the past a professor or should be at the time attending an institution where children are treated.

Dr. I. N. LOVE of St. Louis—I rise to place before the Section the subject of the organization of a national pediatric society. Some steps have been taken toward securing such an organization. I have thought that if this body would pass a resolution, stating that it is the sense of this body that such a society should be organized, it would be helpful. Such an organization should be thoroughly national in its character and should limit its membership to those who are or have been active instructors in pediatrics. Such a body would then be authoritative and its scope would be such as to secure representative membership in every State in the Union, making it a thoroughly national body, not what some of our so-called national bodies are, an aggregation of men from one part or another of the country. We do not, and one should not, desire to have the membership among those not engaged in the work. I think a recommendation from this body that such an organization should be established would dignify it and strengthen it.

SOCIETY NEWS.

Western Surgical and Gynecological Association.—

DENVER, COLO., Oct. 1, 1897.

To the Surgeons and Gynecologists of the West:—The next meeting of the Western Surgical and Gynecological Association will be held in this city December 28 and 29. It is the purpose of the members of the Association, and of this Committee, to make this meeting one of unusual interest, and the papers and attendance promised indicate that the effort will be successful. This Association is the surgical society of the West, and must become to the West what the Southern Surgical and Gynecological Society is to the South. To this end it is desired that the many able and skilful surgeons and gynecologists of the West be brought to this meeting and enlisted in the organization for scientific work.

We are so much cut off from the scientific societies of the East and South that it is imperative that we create for ourselves a society that will foster among us the true scientific spirit and give us a better knowledge of each other.

If you are doing surgical or gynecologic work, and can by any possibility arrange to be at this Denver meeting, do so by all means, it will be representative of the best and most advanced surgical skill among us and you can not afford to be absent. If you have a paper you would like to read, write to the Secretary at once and ask for a place on the program, but make your plans to come to Denver on December 28, and at least contribute by your presence to the success of the association. We need you; you need us. A banquet will be given the visitors by the physicians of Colorado, and every effort will be put forth to make the stay of each individual as pleasant and profitable as possible.

Committee of Arrangements at Denver: Drs. W. W. Grant, Chairman; C. K. Fleming, Secretary and Treasurer; L. E. Lemen, T. H. Hawkins, Leonard Freeman, W. B. Craig, W. A. Jayne, H. G. Wetherill.

The Albany Medical College Alumni Association.—The third annual meeting of the Albany Medical College Alumni Association of Greater New York was held December 3 at the residence of Prof. Wm. H. Thomson, M.D. Preparations were made for the third annual banquet to be held Jan. 20, 1898, and the following officers were elected: President, Horace Tracy Hanks; vice-president, John J. Van Rensselaer; secretary, Warren C. Spalding; assistant secretary, Edward F. Quinlan; treasurer, Henry H. C. Muller; governors, William Stevens, Frederic Loughran, S. E. Armstrong, Howard J. Wood, New York, and H. B. Maben, President Albany Medical College Alumni Association, member ex officio.

Societies.

The following meetings are noted:

Illinois.—Chicago Medical Society, December 1. The Chicago Pathological Society, December 3, the address being by Dr. George M. Sternberg, Surgeon-General U. S. A., on the "Etiology and Pathology of Yellow Fever."

Iowa.—North Iowa Medical Society, Calmar, December 4.
Michigan.—Saginaw County Medical Society, Saginaw, December 1.
Massachusetts.—Thorndike Medical Club, Boston, November 29.
Missouri.—St. Louis Medical Society of Missouri, December 4.
Nebraska.—Lincoln Medical Society, November 28.
New York.—The Medico-Chirurgical Society of Central New York, Syracuse, December 2.
Ohio.—Cleveland Medical Society, November 26. Lucas County Medical Society, Toledo, November 19. Pickaway County Medical Association. Circleville, December 1. Sandusky County Medical Society, Fremont, December 2.
Pennsylvania.—Delaware County Society, Chester, November 19. Lancaster City and County Medical Society, December 1. Pittsburg Academy of Medicine, December 2.

NECROLOGY.

J. C. EASTMAN, M.D., Hampstead, N. H., November 27, aged 86 years 7 months. The Doctor was graduated from Dartmouth in 1837. In August, 1861, he was appointed surgeon of the Fourth Regiment, New Hampshire Volunteer Infantry, with the rank of major. He was in service with the regiment at Washington, Annapolis, Port Royal, Hilton Head, St. Augustine and Jacksonville until 1863, when he resigned. Dr. Eastman was one of the oldest members of the New Hampshire Medical Society, of which he was president in 1860; a member of the Rockingham Medical Society, also of the AMERICAN MEDICAL ASSOCIATION, and was one of the three representatives from New Hampshire to the International Medical Congress held at Philadelphia in 1876. Dr. Eastman was twice nominated for councilor for his district; was a delegate to the convention which nominated General McClellan for the Presidency. In 1849, while a member of the legislature Dr. Eastman introduced the bill entitled "An Act Providing for the Establishment of Public Libraries," which became a law under the signature of Governor Dinsmore, and New Hampshire was the first State in the Union to empower towns and cities to maintain free public libraries by taxation as a result of the passage of that bill. Dr. Eastman was largely instrumental in the building of the Nashua and Rochester Railroad and served as a director.

AUGUSTUS HUEHNE, M.D., New York Medical College (now extinct) 1858, died at his home in Kingston, N. Y., December 2. He was born in Hanover, Germany, about seventy-seven years ago, but came to New York in 1852 and there engaged in the drug business, finally to become a general practitioner of some forty years standing. Among his survivors are two sons, both physicians.

JAMES OLMSTEAD, M.D., Yale 1874, died at the Grenoble Hotel, New York City, December 4, aged 48 years. In 1877 he received an appointment at the Connecticut Hospital for the Insane, Middletown, Conn., of which he became superintendent in 1886. He never lost a day from duty until he came to New York for treatment two weeks before his death. He left a widow and one child.

JOHN E. WHITESIDE, M.D., Medical Department of the Pennsylvania College, Gettysburg (now extinct) 1847, and a practitioner for fifty-three years, died at Atlantic City November 25, aged 74 years. His home was in Philadelphia.

WILLIAM N. GILCHRIST, M.D., died at the Windsor Hotel, New York City, December 3, age 74 years.

CHARLES T. ALLEN, M.D., Minneapolis, Minn., November 28.——Lafayette Campbell, M.D., Chillicothe, Iowa, November 29.——Hiram S. Crandall, M.D., Leonardsville, N. Y., of cancer of the stomach, November 29.——Edward Livingstone Welling, M.D., University of Pennsylvania 1860, died at his home in Hennington, N. J., November 29, of cardiac disease, aged 63 years.——Paul Güterbock, M.D., Privat Docent of surgery in Berlin, with rank of professor, at the age of 54 years, and whose work in surgery of the urinary organs was notable.——Aurelio Silvestri, M.D., Lecturer in Ophthalmology in the Florence School of Medicine.——Arthur Scheffer, M.D., formerly Professor of Chemistry and Medical Physics in the University of Kieff.——H. Daniels, M.D., Privat Docent of Psychiatry, St. Petersburg.——George H. Goodyer, M.D., Toledo, Ohio, November 26.——Fred H. Kauwertz, M.D., Milwaukee, Wis., found dead in his office November 25, aged 28 years.——William J. Kernan, M.D., Albany, N. Y., Albany Medical College 1891, November 26.——Robert S. Lewis, M.D., Culpepper, Va., November 28, aged 68 years.——J. C. W. Moore, M.D., Concord, N. H., November 28, aged 60 years. The Doctor was a graduate of Dartmouth Medical College, and on the breaking out of the Rebellion enlisted in the Seventh New Hampshire Regiment and was discharged in 1863 on account of promotion to the Eleventh New Hampshire, in which he served throughout the war as assistant surgeon.——J. R. Sparkman, Plantersville, S. C., aged 82 years.——Thomas Stillwell, M.D., Fremont, Ohio, November 30, aged 82 years.——William P. Taylor, M.D., Abingdon, Md., November 23, aged 46 years.——Edward W. Welling, M.D., Pennington, N. J., November 29. He was graduated from Princeton in 1857 and a few years later from the University of Pennsylvania. During the Rebellion he served as a surgeon under Colonel McAllister, and last year was appointed surgeon at the Soldiers' Home at Hampton Roads.

BOOK NOTICES.

Hand-Book of Materia Medica, Pharmacy and Therapeutics, including the physiologic action of drugs, special therapeutics of disease, official and practical pharmacy. By SAMUEL O. POTTER, A.M., M.D., M.R.C.P., London; pp. 900. Philadelphia: P. Blakiston Sons & Co. Price $4.50. (From Edward Speakman, medical bookseller, Chicago.)

This edition is one-eighth larger than its immediate predecessor, and is almost a new book, although retaining the general plan and special features which have proved so acceptable in previous editions. Ninety-seven pages have been added and many new articles in the Section on Materia Medica.

A patent thumb index has been placed in the book for the convenience of the reader at the commencement of the several departments of the book.

From our examination we are satisfied that notwithstanding the numerous works on the same subject now on the market the work of Dr. Potter will be found in the front ranks. We regret to see the rather unfriendly tone of Dr. Potter for the decimal system of weights and measures, although in the sample prescription, page 506-507, simple rules are given for metric prescriptions, but they are nowhere incorporated in the text, nor in the general formula.

Dr. Potter writes well, his language is precise, correct, and his opinions are his own, and have been carefully matured.

Manual of Gynecology. By HENRY T. BYFORD, M.D. Second edition, containing 341 illustrations; pp. 596. Philadelphia: P. Blakiston Sons & Co. 1897. Price $3. (From Edward Speakman.)

The first edition of Professor Byford's book appeared in 1895, and a few changes in the text were therefore required, but a large amount of new matter has been added to this volume, which has been simplified and by devoting several "parts" each of carcinoma, sarcoma, and cystic tumors. Some of the chapters have been rewritten. Marginal notes have been added throughout the book.

In its new form the book will be more popular than ever. The work will be found fully up to date.

A Practical Treatise on Diseases of the Skin. By JOHN V. SHOEMAKER, M.D., LL.D. Third edition, revised and enlarged with chromogravure plates and other illustrations. Pp. 894. New York: D. Appleton & Co. 1897.

The first edition of Professor Shoemaker's book appeared in 1888, and the second one in 1892; many changes have occurred in the pathology and etiology of the treatment of diseases of the skin, a number of new preparations have been introduced and the most important of them that have been thoroughly tested are noticed in the work. A short account has been

given of mycosis fungoides and actinomycosis, neither of which diseases appeared in the former editions. The conclusions reached by the latest investigators in symptomatology, diagnosis and etiology treatment have been added to the volume.

The illustrations are excellent and in general we must say this edition fully merits the support and consideration given its predecessors.

Skin Diseases of Children. By GEORGE HENRY FOX, A.M., M.D., with twelve photogravure and chromographic plates and sixty illustrations. Pp. 166. New York: William Wood & Co.

A series of illustrated articles on certain skin diseases which occur in infancy and childhood, appeared in the *American Journal of Obstetrics and Diseases of Women and Children*, and are now published in book form. Some additions have been made to most of them and as the work now stands it will be found to be one of the most useful treatises on the subject that has appeared, one of which will be useful to every practitioner.

We observe with pleasure that the metric system of measures has been adopted in the formulæ recommended in the book. The illustrations are excellent.

Hutchison and Rainy's Clinical Methods. Clinical methods, being an introduction to the practical study of medicine. By ROBERT HUTCHISON, M.D., M.R.C.P., Demonstrator of Physiology in London Hospital Medical College, and HARRY RAINY, F.R.C.P., F.R.S.E., University Tutor in Clinical Medicine, Royal Infirmary, Edinburgh. Handsome 12mo, 562 pages, 137 engravings and 8 colored plates. Cloth, $3. Lea Brothers & Co. Philadelphia and New York.

Although the author modestly disclaims that the book is a clinical diagnosis, yet as a matter of fact it is so, for it describes those methods of clinical investigation by which the proper application, and correct diagnosis can alone be arrived at.

The work includes chapters on case taking; general condition and appearances as applied to the alimentary system and the abdomen; circulatory system; the blood; respiratory system; the urine; the skin; the nervous system; eye; ear; throat; nose; locomotory system; clinical examination of children; examination of pathologic fluids; clinical bacteriology.

The work is finely illustrated and has an excellent index.

Spinal Caries. By NOBLE SMITH, L.R.C.P., London. Second edition; pp. 153. Smith Elder & Co., 50 Waterloo Place, London. 1897. Price 5s.

This is a practical treatise on inflammatory diseases of the spinal column. It is accurate, pains-taking and up to date. The work is a valuable addition to surgical literature. This edition, while very little changed from its predecessor, has been improved by the correction of some errors and description of new instruments. The methods of supporting the diseased spinal column are thoroughly and wisely discussed.

Mastoid Abscesses and Their Treatment. By A. BROCA, M.D., Paris, and F. LEBET-BARBON, M.D., Paris; translated by HENRY J. CURTIS, B.S., M.D., London; pp. 268. H. K. Lewis, 136 Gower St., London. 1897. Price 6s.

This volume is a translation of a memoir on suppurations of the mastoid process and their treatment, which was originally published in 1895 after having been awarded the Meynot prize by the French Academy of Medicine. The eleven colored illustrations are from Mr. R. J. Godlee's paper of the "International Clinics," volume 2, 6th series. The work is an excellent one, both in the original and in the translation, but for an American reader it was really unnecessary to translate the Centigrade scale into the Fahrenheit.

The Medical News Visiting List for 1898. Seal grain leather, $1.25. Thumb-letter index, 25 cents extra. Philadelphia and New York: Lea Brothers & Co.

This visiting list is published in three forms: the weekly list, dated for thirty patients; the monthly, undated, for 120 patients per month; the perpetual, undated, for thirty patients weekly per year. The list contains much data of use to the physician and many blank pages. Each style is a well-shaped book with pocket, pencil and eraser.

Proceedings of the Seventh Annual Meeting of the Association of Military Surgeons of the United States at Columbus, Ohio, May 25, 26 and 27, 1897. Edited by JAMES E. PILCHER, M.D., Captain Medical Department U. S. Army. Pp. 694. Columbus, Ohio: Erwin Printing Company. 1897.

This volume includes the minutes of the meeting, reports of the various officers and the papers read at the annual meeting.

It is only fair to the editor to say that this work is not only larger than its predecessor but very much better printed and better edited.

The Society is flourishing and every qualified officer in the National Guard should become a member.

The New Mexico Medical Society. Sixteenth annual meeting held at Albuquerque, N. M., May 12 and 13, 1897. Paper; pp. 12.

This is a report of the sixteenth annual meeting, and also contains a brief history of the Society, lists of officers and members, and the by-laws of the Society.

MISCELLANY.

"The Laryngoscope."—Beginning January, 1898, a foreign edition of *The Laryngoscope* will be published by John Wright & Co., London, England.

A Medical College Burned.—The Tennesse Medical College, Knoxville, Tenn., was burned December 3. The building was comparatively new and cost $25,000, contents $12,000.

Hospital for Cornell.—William R. Sage of Ithaca and Dean Sage of Albany have presented to Cornell University the residence of the late Henry W. Sage for a students' hospital and besides equipping it will endow it with $100,000.

Foreign Medical Students at Paris.—The recent regulations restricting the privileges of the Ecole de Médecine have all been rescinded, and the old order of things restored. Foreigners can now enter and matriculate as in the past.

Compliment to Professor Senn.—A public reception was given to Prof. Nicholas Senn, on December 8, at the Newberry Library, in recognition of his generosity to that library through donations he has made. The medical profession of the city were invited and largely attended. Nearly every physician of prominence was present. Speeches were made by President W. B. Blatchford, Dr. Fernand Henrotin and Professor Senn. The occasion was a memorable one in connection with library movement in Chicago.

Cerebral Complications of Actinomycosis have been observed by Bourquin and Quervain, a meningitis and encephalitis, which are invariably fatal, as the parasite always continues its invasion. Treatment with potassium iodid is ineffectual at this secondary stage of the disease. The symptoms are those of other cerebral abscesses or chronic lesions of the brain.—*Jour. de Méd. et de Chir.*, October 25.

Large Bequests to Massachusetts Charities.—Many worthy institutions in Boston are remembered in the will of Eliza Ann Collins, widow of Jeremiah Collins, which was filed for probate in Dedham in November. The Home for Aged Couples and the Home for Aged Women, Boston, will each receive $10,000; Perkins Institution for the Blind and Massachusetts Charitable Ear and Eye Infirmary, Boston, $5,000 each; Massachusetts Society for the Prevention of Cruelty to Animals, $15,000; and the Home for Aged Men, $10,000.

Total Abstinence and Life Insurance.—Emory McClintock, a life-insurance actuary, has made a very careful examination of the records of all policy holders of his company, classifying them as abstainers and non-abstainers. The main results of his examination are summed up by him as follows: "Upon those who on entering stated that they abstained from alcoholic beverages the maximum expected loss was $5,455,669 and the actual loss was $4,251,050. Upon those who stated otherwise the maximum expected loss was $9,829,462, and the actual

loss was $9,469,407. These abstainers show, therefore, a death loss of 78 per cent. of the maximum and the non-abstainers 96 per cent."

Size of Bullet Judged from a Wound.—In a homicide case, the surgeon who attended the deceased prior to his death testified that he examined the gunshot wound which caused the death, and that he had examined gunshot wounds in the past, and taken bullets therefrom, and knew the size of the bullets making these various wounds, and that the wound in question was inflicted by a 41 or 44 caliber bullet. This evidence, the supreme court of California, in the People against Wong Chuey, holds admissible. It says that the witness was sufficiently versed in the subject of gunshot wounds and the respective size of bullets to give evidence of the character here adduced.

Etiology of Chorea.—Prof. Cesaris De Mel announces that he has discovered a lanceolate encapsulated diplococcus in a case of typical chorea, extremely pathogenic for guinea-pigs, in which it determines a hemorrhagic hyperemia, with diminished fibrin and no edema. The histologic lesions in the nervous system of the case and in the viscera of the animals showed that the effect was more toxic than septic, and with an elective action on the vessels. This announcement sustains Prof. Leroux's theory that chorea is a syndrome determined by some infective or toxic agent on a soil prepared by an inheritance of neurotic and arthritic tendencies. In this case the degenerative lesions considered specific by other authors were absent.—*Gaz. degli Osp. e delle Clin.*, August 22.

The Sixtieth Anniversary of the Birth of Photography was celebrated in France recently by the erection of a statue to Daguerre in the small town where he was born. To the scientist Arago is due the honor of recognizing the value of the new invention and presenting it to the world, and rarely has an inventor reaped such instantaneous fame as fell then to Daguerre. With the application of collodion, the daguerreotype disappeared and modern photography took its place, with the sun now supplemented by the Crookes' tube, which has added photography to the medical sciences and rendered it one of the most important subjects presented at the various medical congresses this year.

Virchow's Fiftieth "Docent Jubilee" was celebrated November 6th at Berlin by his friends and pupils, who hailed him as *Preceptor Mundi*, and reviewed the work accomplished during his fifty years professorship with veneration and pride. The congratulations were the more cordial as he had been compelled to leave the lecture room the day before from a slight indisposition, which however proved transient. He deprecated the excess of honors that have been showered upon him lately, observing that he seemed to himself like a tree whose leaves had been stripped off to enable it to present a better appearance. He remarked that if he had succeeded sooner than others in establishing a school, it was because he early recognized the fact that one can not do everything himself, and he had organized a solid phalanx which had been strong enough to withstand opposition and lay foundations broad enough for future development. He announced in conclusion that he had succeeded in convincing the government of the necessity of a new building for the pathologic museum, which was now assured.

A Liability Without Contract.—A firm of wholesale druggists in the province of Quebec received an order for bismuth from an apothecary, but by mistake sent him antimony. A dose of antimony, in a prescription calling for bismuth, was consequently administered to a sick woman with injurious effects, and a suit for damages was brought against the firm from which the apothecary obtained the antimony. The trial court decided that the firm were responsible for the injury. The superior court of Quebec held that there was no such relation between the original venders of the drug and the injured person as to render the defendants liable, but that the real responsibility lay with the apothecary. The provincial court of queen's bench took the contrary view, saying that, although there was no contract, there was a liability. On November 12 the defendants applied to the Judicial Committee of the Privy Council in London for leave to appeal to that tribunal (which is the court of last resort for colonial cases), and special leave was granted. The final decision will be awaited with interest.

Foreign Body in the Air Passages.—Nordman describes his experience when summoned to a child dying of suffocation from having "swallowed something." All efforts to find the foreign body were in vain. Tracheotomy was performed without results and respiration had ceased, although the heart was still beating. Artificial respiration was kept up with frictions and injections of ether until more than an hour and a half had passed, when suddenly a small balloon appeared at the tracheal opening, having been distended and forced upward by the artificial respiration. It was easily extracted and found to be one of the toy whistles consisting of a wooden part, 2.5 cm. by 8 mm., and a small balloon 2.5 cm. by 2.5 cm., which had lodged beyond reach in the right bronchus.—*Journ. de Méd. et de Chir.*, October 25. Another case is reported in which the child had inspirated a smooth slender glass object, but instead of performing tracheotomy as indicated, Bonnus attempted intubation first. In a few moments the object was expelled in a fit of coughing, a new and suggestive application of intubation.—*Presse Med.*, October 30.

The Physical Bases of the Antiparasitic Treatment of Wounds.—An interesting series of experiments at the Institut Pasteur prove that there are other factors to be taken into account besides asepsis and antisepsis. The absorbent nature of the dressings, the position of the wound, and the condition of the atmosphere favor the absorption of microbes, or the reverse, proving in many cases the most effective weapons in the struggle of the organism against the micro-organisms. The physical processes involved are evident when a small roll of gauze is placed astride on the edge of a glass of water, one end touching the water and the other outside, below its level. The water is drawn up into the gauze and soon begins to drip from the other end. If a drop of methylene blue is placed on the gauze the stain will only affect that part of the gauze beyond it, even if that end of the gauze is raised. If strychnin is sprinkled on a wound in mice, it is absorbed and the animal dies, but if charcoal, magnesia, or some similar substance is sprinkled first, or soon after the strychnin, it is not absorbed by the tissues. Intoxication can also be arrested by applying a moist dressing even after the first symptoms have appeared. Similar experiments with putrid matter, anthrax spores, septic blood, etc., show that the microbes do not find an entrance if absorption and evaporation draw the current outward, but if it is checked by stagnation of the secretions, or any cause, the micro-organisms find their way in.—*Semaine Méd.* November 10.

Increased Charitable Accommodations on Blackwell's Island, New York City.—Mayor Strong and the Commissioners of Public Charities have opened eleven new buildings in connection with the almshouse on Blackwell's Island. Commissioner Faure said that at the time of his appointment over five hundred of the inmates were obliged to sleep on the floors for lack of accommodation and that many of those lodged in the top stories could watch the stars through holes in the roof, which freely admitted the snow or rain in stormy weather. There was no water in several of the buildings and no lavatories except makeshifts. Filth covered the floors until the physicians refused to enter one ward unless it was cleaned. He then gave a report of the manner in which the department has expended the million dollars which had been allowed it for improvements, stating that since Jan. 1, 1895, no less than fifty-three new buildings had been erected. In addition to the eleven at

the Almshouse, these included fifteen at the Infants' Hospital on Randall's Island, five at Bellevue Hospital, four at the City Hospital, Blackwell's Island; four at Fordham Hospital, the new Harlem and Gouverneur Hospitals, and the Lodging House for Homeless Men. In delivering the keys of the buildings to the mayor, Dr. Stephen Smith, the new president of the board, said: "Not one dollar of all that million has been spent for filigree or decoration, either on the interior or exterior."

The Paris Academie de Medecine.—Among the communications of minor importance received by this body in the last few months (the others have already been mentioned in these columns), the report of the transmission of mumps to a dog, a Russian hound who lapped up his master's sputa, aroused considerable interest, although some incredulity was expressed by some other members as to the identity of the dog's affection. The pathogenic rôle of dust has also been emphasized there again recently, and several instances related in which epidemics were traced directly to the dust in the cracks of the floor in barracks, etc. Impermeable floors for such places were advocated. Frigoro-therapy was lauded again by Cordes, as the result of ninety-six experiences proves it a powerful stimulant of cellular nutrition (*Vide* JOURNAL, Vol. XXVII, p. 548). Doumer reported the efficacy of the high frequency current in the treatment of painful fissures of the anus and in hemorrhoids. Vaquez described a myocardiac apoplexy discovered at the necropsy, to which he ascribes the sudden deaths during parturition of women affected with mild, chronic heart trouble. He considers it a valuable contribution to the question of sanctioning marriage in cases of known heart disease. Boeckel reported an operation for an inguinal hernia which was found to contain the appendix with the spermatic cord adherent and a loop of the cecum, suppurated and gangrenous. He did not close the artificial anus until three weeks later; perfect recovery. He recalled in this connection an operation, published in 1892, in which he found a matrix and tube in a hernia on a man. Lancereaux communicated a study of the cirrhosis of the liver in habitual drinkers, which forty years of observation have convinced him is not caused by the alcohol, but by the potassium salts in wines treated with plâtrage (calcined gypsum). Laborde disputed his statements, adducing as one of his arguments that in America, where wine is not drunk, and "le wisky" is the principal source of alcoholic consumption, hepatic cirrhosis is frequent. He added that cerebral cirrhosis has also been noted in America by Duplay, who has called attention to this hitherto overlooked lesion. Another interesting communication was in regard to a patient who had suffered much inconvenience from a floating kidney, and finally decided to purchase an appliance to control it. On her way to the city, a ride of several hours by rail, she felt all her discomfort vanish and returned home cured, without purchasing. The cure lasted two or three years when the former inconveniences returned, but again they were cured and this time permanently to date, by taking again the same trip by rail. The Académie expresses disappointment that so few contributions, only three, have been received in competition for two of its most important prizes.

The Vivisection Question.—On November 27 "Vivisection" was the topic for discussion at the Woman's Club, Denver. The following letter was sent by Dr. Charles Denison, who was unable to attend:

DENVER, COLO., Nov. 26, 1897.

To the Woman's Club:—Lying before me is your invitation, received yesterday, to attend the meeting of the Reform Department and take part in your discussion of the subject of "Vivisection."

While I thank you for your kindness, I am constrained to tell you that I can not leave my office to attend, chiefly because I fear it would do no good, and again I might say something under the heat of the debate which would offend the ladies; something perhaps which (you ladies understand how it is) might better be said, if at all, by inference, so as to avoid the direct charge of prejudice or ignorance.

For instance, if I were to explain that the Humane Society, whose general purposes are admittedly most worthy, had inaugurated a crusade against this so-called "vivisection," and directed much of its argument against my professsion for its defense of the same, I should have to explain that only when cornered in a possible but very unlikely debate, would they admit that this word "vivisection" only refers to the cutting up of a live animal, and that an animal under an anesthesia is practically dead for the time being, even though automatically moving. Then of course I would be tempted (only tempted, please,) to show how some women, more easily lured to fanaticism than the rest of mankind, under the new stimulus of this reform age, had taken up the cudgel, and as there is so little of vivisection to attack, they must have the whole question in sight from A to Z, regardless of consequences.

It would not be enough for me to explain that during all my experience, since thirty years ago I commenced the study of medicine, I have seen but one case of vivisection in the limited sense of the animal not being practically dead. The experiment was made by Prof. Austin Flint of New York, and proved of great utility in that it showed to over two hundred medical students that a single drop of woorara poison, previously introduced in a large quantity through an artificial opening (made under chloroform) into a dog's stomach, and without poisoning the dog at all, will kill a dove instantly when this drop is injected under its skin.

If I should thus prove, by the experience of other physicians as well as my own, that this hue and cry about vivisection is a "will o' the wisp" which is a waste of our valuable time to follow, some one would undoubtedly advance the senseless and sensational articles written "by the yard" for the newspapers about the recent dissection of a cat in the Y. M. C. A. rooms. Then I would have to explain that the incident was not so horrible as pictured, and that the young men thus learned the existence and location of internal organs better than by any amount of book reading. Thus the discussion would naturally lead up to the great utility, even among women, of a knowledge of the anatomy and physiology of the internal organs.

Then very likely my argument would be met by a rejoinder of some bright woman, who happens to know something of anatomy, and I fear I would be tempted to put her to a test and ask her where her *spleen* was? She might very likely get ahead of me by claiming that, if I really referred to the organ below the left lobe of the liver, whether she had any *spleen* or not had nothing to do with the question, and retort that doctors did not know anything about the spleen anyway. Of course I would be "floored," so to speak; but in acknowledging the truth of the assertion I might rally a little by claiming that ignorance (of the function of the spleen) is a goon reason why more experimenting with animals should be made in order to attain the truth.

With so many ladies present, one could hardly help being personal, for if I were to refer, as an offset to the little vivisection really done, to the thousands of instances of cruelty to animals constantly occurring in both business and social life, I could not help wounding the feelings of somebody present—either the richly dressed woman whose finery is contributed to by the profits of the cruel practice of branding calves with huge red-hot irons, or the culinary critic who will go into ecstacies over a lobster bisque, never thinking that the animal was slowly tortured to death by lying in cold water which was then heated to the boiling point.

But, seriously, it does seem like the "irony of fate" that you women, whose children the medical profession are trying to save from death by infection and contagious diseases, should join the hue and cry against the very means which are just now proving to be the most successful in overcoming these very diseases. It is probably understood by very few of you that each of these infectious diseases is due to a specific cause, which can only be eliminated from the human system by means of a naturally existing or artificially created antitoxin in the blood of the affected person, and that thus far the chief and only reliable means of discovering these antitoxins has been by animal experiments performed with great pains in physiologic and bacteriologic laboratories.

In illustration I could mention here, for the lack of space to say more, the custom of experimenters to poison guinea-pigs with virulent tuberculin, diphtheritic or other poisons, that they may then neutralize these toxins and prevent the animals dying by the use of the proper antitoxin to the given disease. The advance of science is nowadays replete with this kind of evidence, and while it may take hundreds of guinea-pigs to establish such a cure, we claim that any discriminating person

ought to be willing to put the life of a little child against a million of these vermin, if necessary.

The fanaticism of some people impells me to relate, in this connection, the late experience of a brother physician in Philadelphia. A friend of his had three children, the two oldest of whom were attacked by malignant diphtheria. They were attended by a so-called "Christian science healer," who was put in charge, and both in due time died. The third child came down with the same virulent disease and the neighbors insisted on my doctor friend being called. He came and happily in time injected the new antitoxin for diphtheria, and the child recovered. The irony comes in when, less than two months afterward, this friend of his, the father of these children, comes to ask the doctor to attend with him a "Christian science" meeting! Do you wonder that doctors get very "tired" in view of such perverse conditions, and are moved to exclaim, with the poet Burns, "It's hardly in a body's power to keep at times frae being sour, to see how things are shared."

I am, with much respect, Yours very truly,

CHARLES DENISON, M.D.

Denver.

THE DENVER AND ARAPAHOE MEDICAL SOCIETY.—At the regular meeting held November 23, Charles A. Powers read a paper entitled "Methods and Results in 450 Cases of Fracture of the Forearm Bones." Of these cases 429 had been under the author's care at the Chambers Street Hospital and at the New York Hospital, the remainder being gathered from private practice. After giving general statistics and diagnosis, the author divided his cases into classes: 1, of the radius; 2, of the ulna; 3, of both bones combined; each class being further subdivided into the fractures through the upper fourth, through the middle two-fourths, and through the lower fourth. Each of these nine classes was considered at length, with illustrative cases, methods, management and results. The latter were, on the whole, entirely satisfactory, although the author felt that under no form of management could an absolutely perfect result be attained in every case, especially in those fractures at the lower end of the radius known as "Colles." Dr. H. T. Pershing, in discussing the paper, emphasized the danger of keeping a splint on too long. He mentioned a case of injury to the shoulder which was followed by neuritis. Some one applied a splint which remained on for five weeks, with the result that the fingers became stiff, and although the patient has aquired some motion, it is very imperfect. Dr. Powers also reported the history of an interesting case of fracture of the skull and exhibited the patient: Male, 40 years old, struck in the head by a street-car. When seen by Dr. Powers there was no paralysis or anesthesia. There was a lacerated wound beginning on the right side about one inch above the middle of the margin of the orbit and extending up and back to the temporal parietal articulation. The depressed bone, measuring two and one-half inches in all directions, was removed; frontal sinus found to be open; the dura and brain lacerated. The wound was thoroughly washed, the scalp wound sewn up and the patient reacted well. It was found that there was a fracture through the posterior part of each maxilla and across the root of the nose thus loosening the whole face, which moved freely when the patient talked. No plate could have been inserted owing to the unclean condition of the wound. The patient presented a large depression on the right side of the frontal bone, which disappeared when the patient stoops. Ophthalmologic and neurologic examination showed no deviation from the normal. Dr. A. C. Godfrey exhibited two specimens of anomalies of the arch of the aorta as found in the dissecting room of the Denver Medical College. In one, the left vertebral came off between the common carotid and subclavian. In the other the arch of the aorta was found divided shortly after its origin from the left ventricle. One of the divisions, the right, gives off all the branches except the subclavian. The innominate artery, therefore, gives off the left common carotid in addition to the right common carotid and subclavian. Dr. Bane read a paper on "The Card Index System for Keeping Records of Cases." Dr. Ferm recommended the use of the card system in dispensaries where several students can take the histories of cases at the same time. Dr. J. N. Hall reported a case of splenic leukemia illustrated by microscopic slides in which the white and red blood-corpuscles were in the proportion of one to five.

THE DENVER CLINICAL AND PATHOLOGICAL SOCIETY.—At the meeting of the Society held November 12, Dr. Le Mond reported a case of a nun, 69 years old, who was injured by an explosion of a lamp. The accident was followed by glaucoma and later a cataract in one eye. The pressure having been relieved by an operation, hemorrhage followed and caused the loss of eyesight.

Dr. Leonard Freeman reported a case in which he operated for gallstones and none were found. Soon after the operation the patient commenced to vomit blood, and on the ninth day died. At the autopsy no cause for the bleeding could be found. Gallstones were found in the common gall-duct. Dr. Wetherill demonstrated an original device for classroom demonstration of the different layers of the abdominal wall. Dr. Hershey reported the good results he obtained from the use of atropin and cocain in shock and morphin poisoning. Dr. Powers reported a case of appendicitis, with exhibition of specimen, which was complicated by a tear in the bladder wall.

HEALTH OF THE CITY.—The total number of deaths during the month of October was 67, representing a rate of 12.52 per 1,000 per annum. Number of days with 0.01 inch or more of rainfall, 6. Possible hours of sunshine, 345. Total hours of sunshine, 284. Mean barometer, 24.77.

CHANGE OF ADDRESS.

Fitzgibbon, T., from 410 Grand Avenue to 415 Grand Avenue, Milwaukee, Wis.

Lahy, M. M., from Chicago, Ill., to 510 E. Park Avenue, Anaconda, Mont.; Le Moyne, F., from Pittsburg, Pa., to Santa Barbara, Cal.; Lively, W. M., from Detroit to Oak Bluff, Texas.

Martin, W. A., from 302 Stockton to Spring Valley Bldg., San Francisco, Cal.; Marshall, F. B., from Ransom to Girard, Mich.

Stribling, J. S., from Sherman, Texas to Walhalla, S. C.

Ward, W. H., from Byrne Blk., to 125 No. Broadway, Los Angeles, Cal.

LETTERS RECEIVED.

Atkinson, W. B., Philadelphia, Pa.; Abbott, W. C., Chicago, Ill.; Anderson, W. E., Pensacola, Fla.; American Therapeutic Co., New York, N. Y.; Arment, S. B., Bloomsburg, Pa.

Boehringer, C. F. & Soehne, New York, N. Y.; Bacon, C. S., Chicago; Breitenbach, M. J. Co., New York, N. Y.; Boyd, G. M., Chicago; Braymer, O. W., Camden, N. J.; Bell, Samuel, Newberry, Mich.; Bracken, H. M., St. Paul, Minn.; Bamton, J. F., Rockford, Ill.; Bergy, D. H., Philadelphia.

Cowden, S. H., Morrilton, Ark.; Christison, J. S., Chicago.

Downing, B. R., (2) Greenfield, P. O., Ark.; Dewey, F. S., Oklahoma City, O. T.; Dawson, M. E., Cardington, Ohio.

Edes, Robt. T., Boston, Mass.; Edson, C. E., Denver, Colo.; Elliott, H. G., New York, N. Y.

Foster, A. H., Chicago; Fischer, George, Hannover, Germany.

Graham, H. G., Chicago.

Hummel, A. L., Advertising Agency, New York, N. Y.; Hikotaro, Inui Okayamamura, Gamogun, Ohmi, Japan; Hertzler, Arthur E., Halstead, Kan.; Hay, E. C., Hot Springs, Ark.; Hare, H. A., Philadelphia, Pa.

Jarrett, G. F., Detroit, Mich.

Koechel & Co. Victor, New York, N. Y.; Klump, J. A., Williamsport, Pa.; Knowles, W. L. M., Felchville, Vt.; Keefe, D. E., Springfield, Mass.

Leach, R. B., Minneapolis, Minn.; Lee, W. P., Fairfax, Minn.

Murfree, J. B. Jr., Murfreesboro, Tenn.; McAlister, Stanwood, Mich.; Mac Clure, T. R., Lansing, Mich.; Merrick, M. B., Passaic, N. J.; Meisenbach, A. H., St. Louis, Mo.

Nottage, H. P., Providence, R. I.

Prewitt, N. V., Winchester, Ky.; Parke, Davis & Co., Detroit, Mich.

Rhoades, L. J., Plainfield, Wis.; Reed & Carnrick, New York, N. Y.; Redaction de Janus, Amsterdam, Holland.

Savage, G. C., Nashville, Tenn.; Smith, W. G., Sturgis, S. D.; Spagel, A., Frankfort a. Main, Germany; Sherman, I. L., Kingston, N. Y.; Schering & Glatz, New York, N. Y.; Sinard, Alf. Sr., Quebec, Canada; Savage, G. C., Nashville, Tenn.; Scott & Bowne, New York, N. Y.; Sanitarium, The, Battle Creek, Mich.; Stuart, J. H., Minneapolis, Minn.

The Nutrolactis Co., New York, N. Y. Tessier, L. P., Augusta, Ga.; Thorington, Jas., Philadelphia, Pa., Thibierge, Georges, Paris, France.

Wingate, U. O. B., Milwaukee, Wis.; Wight, A. H., New Hampton, Iowa; Wood, C. M., Decatur, Ill.; Wall, G. A., Sec., Albuquerque, N. M.

THE PUBLIC SERVICE.

Army Changes. Official List of Changes in the Stations and duties of officers serving in the Medical Department, U. S. Army, from November 26 to December 3, 1897.

Capt. Norton Strong, Asst. Surgeon, is granted leave of absence for three months, to take effect Dec. 1, 1897.

First Lieut. Basil H. Dutcher, is relieved from duty at Ft. Leavenworth, Kan., and ordered to Ft. Grant, Ariz., for duty at that station.

RETIREMENT.

Major Joseph K. Corson, Surgeon, having served more than thirty years in the Army, is on his own application, by direction of the President, retired from active service this date, Nov. 30, 1897.